ELECTRICAL WEST

FOR MORE EXPERIMENTS

Change, transition, evolution. These are restless and exciting times. Popular demand and popular desire call for experiment, for something new. Revolutionary departures from precedent win wide acclaim.

¶ Lest it be left in serene and complacent contemplation of the past, let the electrical industry heed all of these signs. To progress it, too, must experiment, must essay new things. Already there are stirrings—the experiment in the San Joaquin, plans and ideas formulating in other sections.

¶ The imagination, the ingenuity and the take-a-chance spirit that started this industry on its way a half century ago are needed now. What if there should be mistakes? All progress is marked by occasional errors. The public wants change, action, leadership. Our industry can provide them.

READY FOR A BIG

NEW POPULAR PRICED RANGE • • • • •

The Triumph

Styled for the Finest Home Priced for the Thriftiest Purse

Now a modern, full size, Table Top Electric Range with straight lines which conform to the styling of built-in, all-electric kitchens. Beautifully finished in gleaming, all-white porcelain enamel.

Look at these Features

- Entirely new principle of construction—all steel body, welded in one piece, provides greater rigidity and relieves strain on enamel parts.
- New design automatic oven temperature control.
- Large utility storage drawer.
- Hi-speed Calrod Surface Units (open coil optional).
- Economical Thrift Cooker.
- Seamless porcelain enamel top.
- New flush-type counter-balanced oven door with concealed roller catches.

Other Features

Porcelain enameled drip tray; appliance outlet; Timer Receptacle; Safety Plug connectors for all surface units; molded Textolite door and drawer handles; both oven units controlled by a single switch; automatic oven timer and clock (slight additional cost).

Dimensions

Floor space, 42 x 25 inches. Height over all, 40½ inches. Cooking Top, 42 x 21¼ inches, 35 inches from floor.

THE LOWEST PRICE RANGE EVER OFFERED WITH SUCH CAPACITY, STYLE, FEATURES AND HOTPOINT QUALITY

RANGE YEAR !!

NEW IMPROVED HI-SPEED *Calrod*

Greater Speed—Maximum Durability

CALROD puts an end to slow electric cookery. Now you can offer *all* the speed necessary for any cooking operation. Calrod cooks as fast as foods will cook. Its amazing speed does not slow up with age.

The new, improved Calrod unit is unbelievably durable. The bruising thumps of pots and pans; the devastating effects of spillage; the punishment of long hours on high wattage, leave Calrod as good as new. Accelerated life tests indicate an average life of 7½ years. It may live for years beyond that. Utility executives, retailers, and housewives, in every section of the country, enthusiastically praise the performance of this spectacular new Calrod.

Look at these striking improvements which give longer life to this *better surface* unit:

1. NEW TUBING — Calrod's outer sheath is now made of nickel chromium alloy — essentially the same material as the inner resistance wire. Withstands highest possible cooking temperatures without scaling, splitting or warping.

2. GLASS SEALED TERMINALS — The new Calrod coils are as completely sealed as the modern Mazda lamp. High-temperature glass, fused into the ends of Calrod terminals and capped with a lava bushing form an airtight, moisture-proof seal. Nothing can get inside this new Calrod coil.

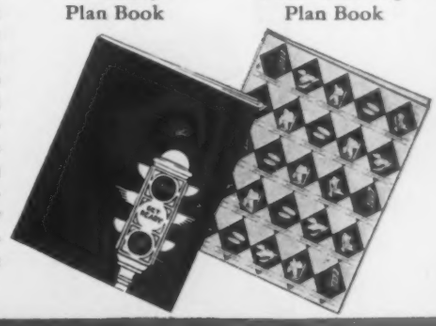
3. "FLASH-PROOF" TERMINAL CONNECTIONS—The two outer terminals, which are most exposed to spillage, are grounded. These terminals are not electrically alive. Even excessive spillage cannot cause a "flash-over" between the sheath and the terminal.

EDISON GENERAL ELECTRIC APPLIANCE COMPANY, Inc., 5612 West Taylor Street, CHICAGO

Hotpoint's *"Get Ready"* and *"Watch Your Step"* Plan Books give you complete programs for immediate sales activity which leads up to an even greater spring and summer sales drive. Hotpoint gives you a most efficient plan for selling. You have the services and cooperation of a thoroughly trained group of range selling specialists and home economists.

"Get Ready" Plan Book

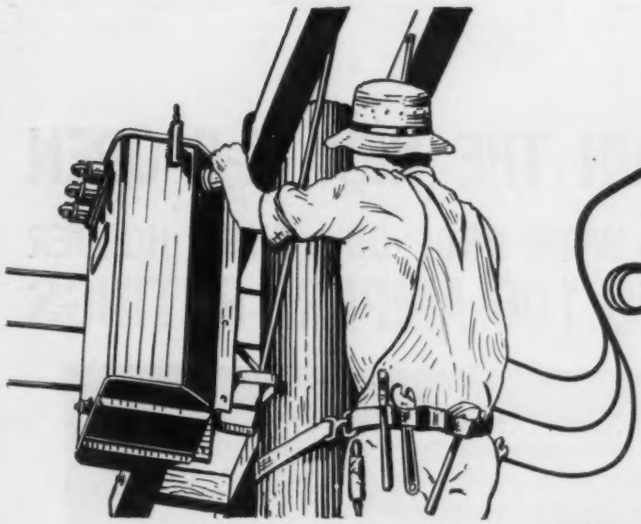
"Watch Your Step" Plan Book



Hotpoint

ELECTRIC RANGES AND WATER HEATERS

YOUNGSTOWN
Make your wiring systems explosion proof, in those hazardous locations, by using this standard full weight rigid steel conduit.
THE YOUNGSTOWN SHEET AND TUBE COMPANY
General Offices-YOUNGSTOWN, OHIO
BUCKEYE
CONDUIT



Linemen

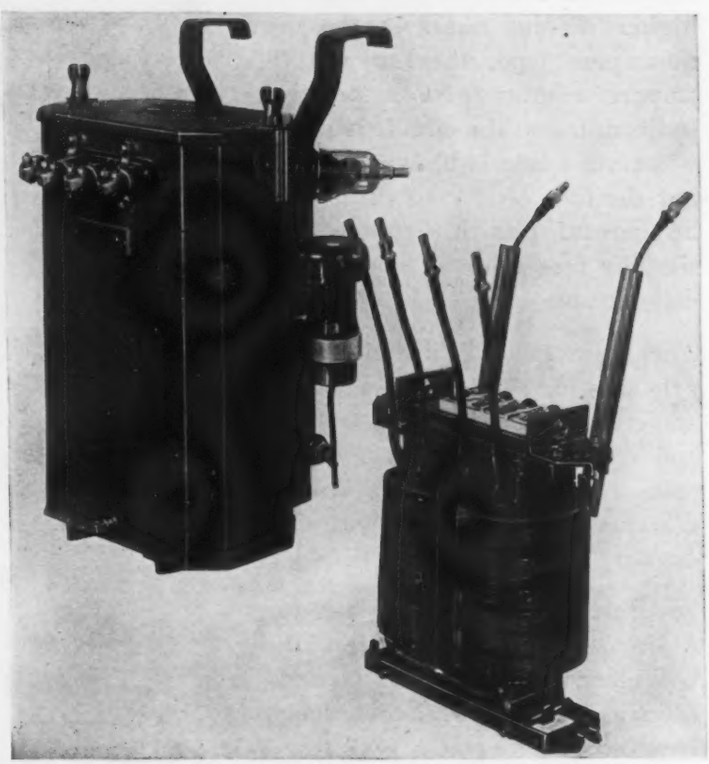
Prefer to Install

Allis-Chalmers Surge Proof Transformers

Solderless connectors on all bushings make it unnecessary for linemen to solder the leads when on the pole.

• • •

A convenient oil sampling device makes it easy to obtain oil samples.



Ask our nearest representative for Bulletin 2166 which describes this advanced transformer.

ALLIS-CHALMERS

Allis-Chalmers Manufacturing Company, Milwaukee

NOW

YOU CAN OBTAIN THE NEW G-E OPEN FUSE CUTOUTS WITH DROP-OUT FUSE HOLDER IN BOTH 60- AND 100-AMPERE RATINGS

NEW RATINGS

7500/12,500Y volts and 15,000 volts, both for 100 amperes, 2000 rms. amperes interrupting capacity

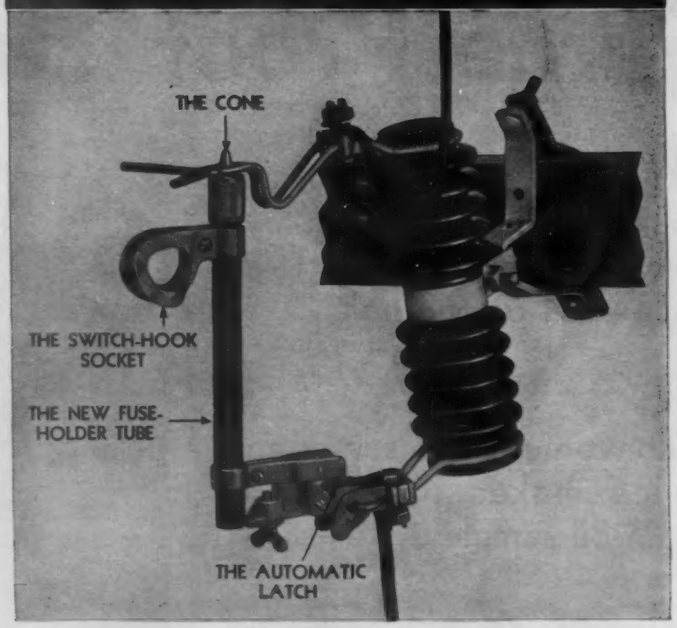
OTHER RATINGS

7500/12,500Y volts and 15,000 volts, both for 60 amperes, 1200 rms. amperes interrupting capacity

THESE two new units extend the application of the recently announced G-E open fuse cutout to higher current ratings. Like the 60-ampere type, these new 100-ampere cutouts give a positive indication that the circuit is open, whenever a fuse is blown, by causing the fuse holder to drop to a horizontal position. They also simplify fuse renewal, and reduce maintenance expense.

The new cutouts are intended primarily for use with 75- and 100-ampere G-E cable-type fuse links and when so fused will give protection over the full range of fault currents up to their interrupting capacity of 2000 amperes (rms.).

For further information, ask for Bulletin GEA-1816. Address the G-E office nearest you, or General Electric, Dept. 6-201, Schenectady, New York.



CONSTRUCTION FEATURES

1. A new fuse-holder tube which will not warp or split. It can easily be replaced without renewing the metal parts of the fuse holder.

2. A cone on the fuse-holder cap maintains contact for sufficient time after the fuse link melts, to assure complete interruption of the short-circuit current within the fuse-holder tube.

3. An automatic latch which prevents the fuse holder's being thrown out of the support by the recoil action.

4. A socket permitting the use of any standard switch hook. The fuse holder need not be touched by hand until it is completely removed from the fuse support.

340-4

GENERAL ELECTRIC

GENERAL CABLE CORPORATION

Announces

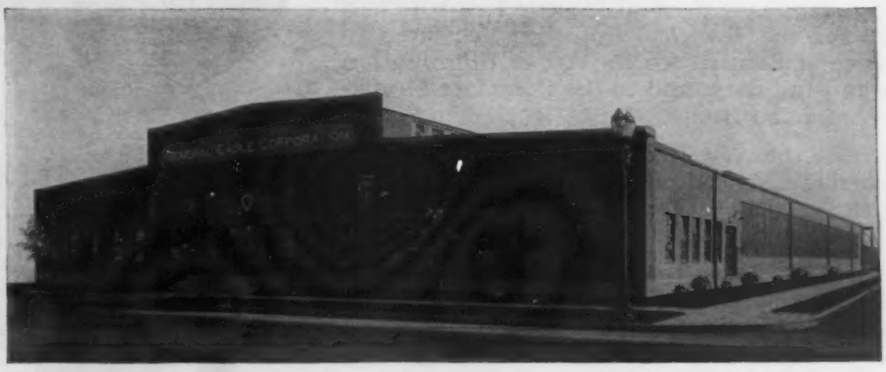
Change in Location of their Sales Office and Warehouse

ON MARCH 1ST, 1934

from

939 EAST 4th STREET • LOS ANGELES • CAL.

...to their New and Modern Cable Plant



3600 MINES AVENUE ••• LOS ANGELES

Telephone ANgelus 4256

◆

Experience • • Quality • • Service

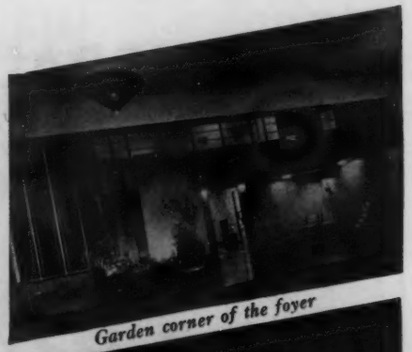
"A STANDARD OF QUALITY FOR OVER HALF A CENTURY"

NOW—A NEW AND GREATER GENERAL ELECTRIC INSTITUTE

New home of General Electric Institute

One of the many classrooms

Show windows demonstrate newest display lighting



Garden corner of the foyer

Miniature streets

How GENERAL ELECTRIC *helps you to sell more lamps*

Your customers look for this MARK

THE new General Electric Institute is a training school for the electrical industry, dedicated to the "New Science of Seeing," to the Art of Illumination for Commerce and Industry, and to the Complete Electrification of the American Home.

The new General Electric Institute unites, under one roof, the former Lighting, Kitchen and Refrigeration Institutes, to create a new and greater *Institute of Electricity*. Here is an ever-changing panorama of electrical progress.

The General Electric Institute is more than an exposition. Here, under the guidance of specialists, is taught and shown everything that is new in lighting for home, store, factory, street, photography and all applications of lighting for life and work.

Today, with the "New Science of Seeing" still in its infancy, the value of the new General Electric Institute as an educational center for Edison MAZDA lamp agents, cannot be too highly stressed. General Electric offers you a course of training, without charge, in the General Electric Institute, as a new and greater service to help you sell more lamps. General Electric Company, Nela Park, Cleveland, Ohio.

DO THESE 3 THINGS AND YOU WILL SELL MORE LAMPS

1. Put in the Edison MAZDA lamp display every time you receive it.
2. Take one of our current magazine advertisements and build a massed display of Edison MAZDA lamps around it.
3. Ask people to buy. Every home needs more and higher wattage lamps.

EDISON MAZDA LAMPS

GENERAL ELECTRIC

450° OVEN HEAT IN 5 MINUTES

TOASTS 8 SLICES IN 3 MINUTES

BROILS A 2 POUND STEAK

BAKES CAKES, BISCUITS, PIES, AND COOKIES

NO TRICKS.. STANDARD COOKING METHODS

COOKS A WHOLE MEAL

List Price
$13.50
Complete

Roasts a 6-7 lb. roast on surface unit

LOOK at the features of this Everhot Compakt

THINK of the market for so much utility

Everhot Compakt, No. 632, is a complete electric cooking appliance at the price of a good toaster. Feature it! Campaign it! See what a money-maker it is!

One-roomers, light housekeepers, small apartment dwellers, summer cottagers—homes where only half the household reports at meal time.

Instead of selling them hot plates, grills and other gadgets show them a Compakt. Don't sell them a $1.98 appliance when they are in the market for $10 to $20 worth of cooking equipment.

The Everhot Compakt is simple to use. Just cook with it like you would a range. Minimum servicing—two heat control. Porcelain enameled light green. Oven-roaster pans furnished.

Don't judge the Everhot Compakt by any other small electric cooking appliance. The Everhot Compakt is quick—complete—has big capacity—sturdy construction—beautiful design and finish—is simple and easy to use. Does all kinds of cooking and baking.

Everhot Compakt No. 632 (pictured) is one of eight Everhot Compakts, retailing up to $20. Get a sample. Write for complete catalog.

"Electric Table Service Saves"

Everhot

THE SWARTZBAUGH MFG. CO.

Toledo, Ohio

Ask your distributor or write for discounts

The Everhot Cooker has introduced electric cooking to tens of thousands of homes.

The Everhot Electric Casserole — oven-glass top—easy-to-clean aluminum insert.

An Invitation

SAN JOAQUIN LIGHT AND POWER CORPORATION
GENERAL OFFICE
FRESNO, CALIFORNIA

A. EMORY WISHON
PRESIDENT

THERE IS SOMETHING NEW...

Free Electricity

We are presenting a plan to break the present consumer habit of economizing on electricity.

We are going to give electricity away.

Our experience tells us the plan will work. A little more than a year ago we let the public ride for nothing on our Bakersfield street cars during certain hours of the day. A lot of people got the street-car habit and continued to ride when we went back to charging fare.

Now we propose to use the same idea with electricity. For two months we will have a system surplus capacity in power plants as well as in transmission and distribution facilities. We are going to give this surplus to domestic and commercial customers of San Joaquin Light and Power Corporation and Midland Counties Public Service Corporation.

Beginning with April meter readings and continuing to the June readings, these customers can use all the electricity they want for the same bill they paid in March. Agricultural customers are to get the surplus for half price. Then in June we will follow up by giving domestic lighting customers opportunity to qualify for special lower rates.

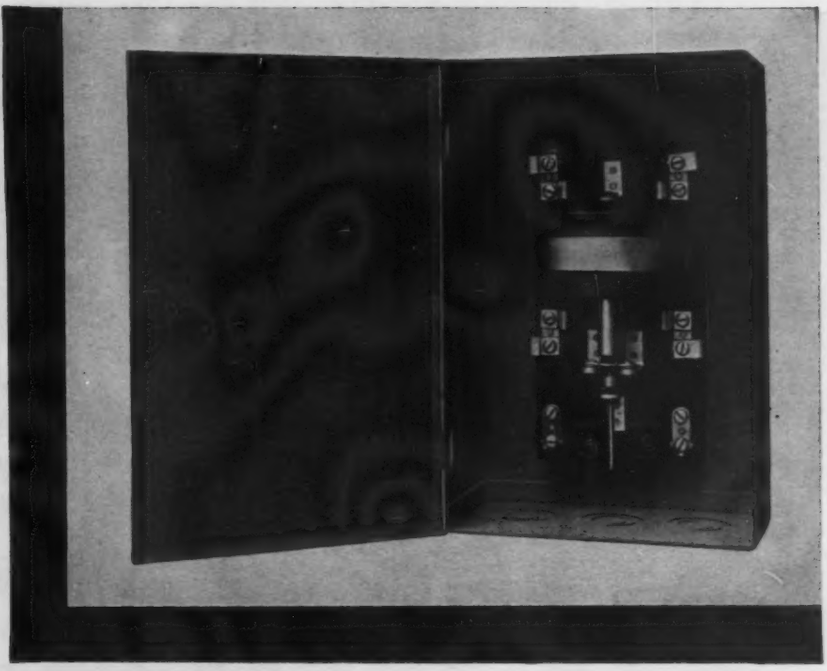
Two months of unlimited use without additional cost—we believe this will sell thousands of our customers on the convenience and economy of doing everything possible electrically. We are tying right in with an extensive sales promotion program of our own, because we feel that the free-use offer and the subsequent rate inducement will stimulate sales of all kinds of appliances and build permanent load.

Here is a chance for every electrical manufacturer, wholesaler, contractor and retailer to make some money. We invite you to join with us in a cooperative sales drive.

SAN JOAQUIN LIGHT AND POWER CORPORATION

A. Emory Wishon,
President.

- ACCURATE
- AUTOMATIC
- SUBSTANTIAL
- LOW IN COST
- EASY TO WIRE
- SILENT OPERATION
- SIMPLE IN DESIGN



DIAMOND E SQUARE D Load Limit Relay

Keeping pace with power company appliance sales expansion programs, Diamond E have designed and developed this load limit relay.

The Diamond E-Square D load limit relay is a substantial solenoid operated switch, designed to automatically interrupt a secondary circuit when load on the preferred circuit exceeds a predetermined amount. Also, it automatically closes the circuit when the preferred load again drops below the predetermined operating point. The field coils of the solenoid are designed for 3 wire, 110-220 volt use capable of carrying loads of from 25 to 5400 watts. The switch is designed to operate at any predetermined operating point designated by the power company.

The load limit relay is enclosed in a hinged cover cabinet size 8½"x12½"x4", with three 1¼" concentric knockouts both top and bottom. PROVISION IS MADE FOR POWER COMPANY'S SEAL.

Ease of wiring, simple automatic operation, low individual cost, sturdy substantial construction, and accuracy, are all features. The load limit relay will positively not interfere with radio reception. Moving parts are cushioned at contact points, assuring silent operation. No oil, or maintenance attention is necessary.

The Diamond E-Square D load limit relay is manufactured by the Diamond Electrical Mfg. Co., manufacturers of electrical control equipment for 20 years. It is power company approved.

DIAMOND E - SQUARE D PRODUCTS INCLUDE:

Switches. Relays. Load Test Sets. Automatic Heat Controls. Dead Front Switchboards. Square-Duct. Fuse Cabinets. Porcelain Products. Manual Compensators. Automatic Compensators. Pressure, Float and Limit Switches. Motor Circuit Switches. Safety Switches. Automatic Motor Control. Remote Control Products. Panelettes. Diamond E Chimes.

DIAMOND ELECTRICAL MANUFACTURING COMPANY LTD.

1320 East 16th Street • Los Angeles, Calif.

AFFILIATED WITH THE SQUARE D COMPANY

Sales Offices:

SEATTLE • PORTLAND • SAN FRANCISCO • DENVER • LOS ANGELES
HOUSTON • PHOENIX • DALLAS • SALT LAKE CITY

Factories:

LOS ANGELES • SAN FRANCISCO • DENVER • HOUSTON
DETROIT • MILWAUKEE • PERU, IND. • WALKERVILLE, CANADA

Let us join your Sales Department

In these pages we have talked to utility companies about the benefits to them of selling Frigidaire. We have talked to them about Frigidaire as a profit-builder for their merchandising departments and a load-builder for their lines. We have talked to them about the service we give them in planning sales. Yet we have never made any pretense that our interest might be entirely unselfish. It isn't.

But we do want to see utility companies make money on Frigidaire, because more money for them, of course, means more business for us. So we do everything possible to insure that result.

And by "everything possible" we mean that we give the utility company a complete line to sell—including household refrigerators, commercial coils and compressors, milk cooling, water cooling, beer and bar cooling equipment, and air conditioners. *And then we help them sell it*—with successful sales plans individually adapted to each company's needs.

With today's increased cost of doing business, electric refrigeration equipment stands out as an important factor in building the additional load that will be necessary to keep those costs within their proper proportion. And Frigidaire stands out as the line of refrigeration equipment that promises most in volume and profits. For complete information write Public Utilities Division, Frigidaire Sales Corporation, Dayton, Ohio.

Frigidaire

A GENERAL MOTORS VALUE

How they do it in THE HILL COUNTRY

Sold 6 G-E Washers in one day—25 in a single month. That's the record of C. D. Jenkins, in charge of the appliance department of the George W. Taylor Co., Williamson, W. Va.

ONCE it was the scene of the famous Hatfield-McCoy feud—this spot they still call "Bloody Mingo."

But Williamson, W. Va., is peaceful enough now. Its population is only 9,000, yet in that small town, C. D. Jenkins of the George W. Taylor Co. went to work—and in one single month—in only 30 days—*he sold 25 General Electric Washers! Six of them in one 8-hour day!*

How did he do it? By luck? By guessing in the dark? Hardly! His boss started advertising—in the G-E way. He used the newspaper ads G. E. prepared for him. He used G-E window strips—G-E hand bills—G-E counter cards. In fact, he didn't overlook a single bet. He took advantage of all G-E promotion material. And how it paid!

What he did — you can do! And the Spring Drive this year is your greatest opportunity to do it . . . because G. E. is giving you more help than ever! Keep back of G-E Washers with everything you've got. Use the Spring Drive selling helps—all of them. They're all good. We've tested them—and they work! Let us show you what real selling assistance is!

• • •

Prices ranging from $49.50 to $149.50, include wringer and centrifugal dryer washers and the G-E Flatplate Ironer at $99.50. Western prices slightly higher.

MAIL COUPON TODAY!

J. M. Wicht, Mgr. Home Laundry Equipment Sales, General Electric Co., Section H-713, Mdse. Dept., Bridgeport, Conn.

I would be greatly interested in hearing more about your line of laundry equipment and the 1934 Spring Drive.

Name_____

Address_____

GENERAL ELECTRIC

Home Laundry Equipment

PYRANOL*

Gives G-E Capacitors These Exclusive Advantages

1. Nonflammability and nonexplosiveness—obvious advantages for all installations

2. Smaller size and lighter weight than is possible with oil-filled capacitors, because of Pyranol's high permittivity and high dielectric strength

3. Economies of construction that have been reflected in lower initial capacitor costs, thus opening a wider field to the benefits obtainable from power-factor correction

Let us tell you more about these G-E Pyranol-treated capacitors. Simply mail the attached coupon, and we will send you our new bulletin, "Improving Power-factor for Profit."

**Pyranol is a trade mark of the General Electric Company,*

NRA MEMBER U.S. WE DO OUR PART

360-88

GENERAL ELECTRIC

General Electric, Dept. 6G-201,
Schenectady, N. Y.

Gentlemen:

Please send me a copy of your practical bulletin, "Improving Power-factor for Profit," GEA-77F.

NAME.....

COMPANY.....

ADDRESS.....

360-88

ECONOMICAL • AUTOMATIC

$8.25

HERE'S MORE PROFIT FOR YOU

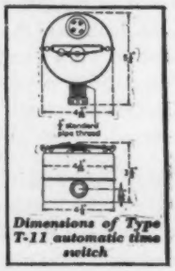
Install this dependable Time Switch for controlled water-heating units

This low-priced, reliable time switch provides a convenient automatic control for circuits operating on a fixed daily schedule. Its dependability and accuracy assure you of added profit by providing the right control, with freedom from regulating and maintenance problems.

Since its contacts interrupt noninductive loads without arcing, and, therefore, without radio interference, this switch is ideal for domestic off-peak water heating.

As illustrated, it is a small, compact unit, easy to install. Complete with 115-volt switch and motor, it is available at $8.25, or with 230-volt switch and motor at $8.75.

For further information, call the nearest G-E sales office, or address General Electric, Dept. 6-201, Schenectady, New York.



Dimensions of Type T-11 automatic time switch

NRA MEMBER U.S. WE DO OUR PART

440-39

GENERAL ELECTRIC

ACCURATE • RELIABLE

Be ready to supply public demand for the new Westinghouse Lightograph Check Chart

Huge Advertising Campaign tells 28,000,000 consumers how to check home and office lighting by using simple chart.

Here is your opportunity to make these charts bring in new business to your store

The 1934 Westinghouse Advertising Campaign—based on a brand new selling idea—totally different from anything Westinghouse ever attempted—depends for its success entirely on *you*. It makes *your* store the turning point in the drive for new sales.

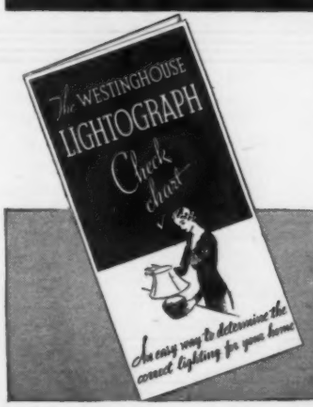
Here's how it works: Westinghouse has created the Lightograph Check Chart. This simple, interesting test tells consumers *at a glance* whether their lighting is good—or bad. There are no "ifs" or "buts"—the answer is either yes, or no. For the first time, the public has a *standard of good lighting* to go by. Ask yourself, will they demand it?

To every reader the advertising says, "Make this test." *But before he can make the test he must get his Check Chart from you.*

That is why the success of this campaign depends on *you*. Six national magazines are carrying the story of the Lightograph Check Chart to 28,000,000 people and this chart is a "feature" in every advertisement! Will you be ready to hand out these charts when your customers ask for them? Remember, 8 out of 10 homes are poorly lighted. That means that 8 out of 10 of your customers need more lamps—higher wattage lamps—and better fixtures. You haven't time to advise each customer about his lighting needs. Let the Lightograph Chart do that for you.

WESTINGHOUSE LAMP COMPANY
30 Rockefeller Plaza New York, N. Y.

Every house needs Westinghouse



Keep your supply of these test charts in plain sight—on the counter. They have selling power. If you work for them—they will work for you.

A complete program for tying in your store with this national campaign is now available. Special material is also available for your use—absolutely free. Ask your jobber salesman about the plan, or, write us.

Copr. 1934, W. L. Co.

Westinghouse MAZDA
TRULY ECONOMICAL **LAMPS**

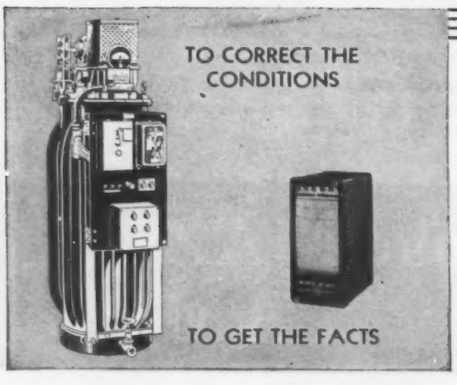
What's Wrong Here?

SIMPLY that a feeder may be underloaded in terms of amperes, and overloaded in terms of good voltage regulation. The true measure of feeder capacity is the range of voltage maintained at the customer's service entrance.

One man with 10 or 12 chart-recording voltmeters can obtain, in a reasonable time, a good voltage survey for a company serving a city of 100,000. May we send you a copy of such a survey, made by our engineers? Simply tear out and mail the attached coupon to-day.

There's Revenue in Regulators

GENERAL ELECTRIC



General Electric Company,
Dept. 6D-201, Schenectady, N.Y.

Gentlemen:

Please send me a copy of "Voltage Survey Points to Closer Feeder Regulation."

Name..... Title.....

Company.....

Address.....

350-105

GO to the People

"LET us go to the people." Since the birth of the Mother of Parliaments that has been the time-honored Anglo-Amercian and democratic method of deciding questions of public import. However, in the past, it has been, primarily, the tool of the politician.

Now the utility chief, forced to reply to attacks of politicians, is going "to the people."

Frank McLaughlin, president of Puget Sound Power & Light Co., through a series of open letters appearing as paid advertisements in the press of his company's territory, is telling the general public of the company's ideals, aims, and problems. He is making constructive suggestions and replying vigorously to destrcutive attacks made upon the company.

Mr. McLaughlin became directing head of the company three years ago. At that time he found the utility faced with competition of two of the largest publicly-owned plants in the world, those of Seattle and Tacoma, both untaxed, both enjoying the material benefits of governmental paternalism. He found these systems, and the politicians capitalizing them, waging a determined campaign to extend their lines beyond the limits of their respective cities.

McLaughlin decided to go straight to the people with his company's story, and today, through his letters, is talking with them.

Reaction, in the form of numerous comments, has been constant. Here are typical excerpts from communications the utility president has received from every stratum of the public of Washington state: "The most constructive letters I've ever read any time, any place," said a grocer, "they ring true, are full of common sense, and are bound to appeal." "You are making many friends," declared an asbestos supply house man, "we hope you continue to fight the propaganda that has seen soaked up in this territory for many long years." "You set forth the basic economics that must be recognized in all fields." asserted a fuel dealer, "and you are doing a good work, not only for your own company but for all industries." "I have agreed with virtually everything you have had to say," wrote a schools superintendent from a Western Washington city.

A shoe repairman signed a 10-year power contract with the company; he said the letters had persuaded him to deal with the privately owned company.

"Your letters will be productive of good results," said an investment broker. "The information contained in your letters should have been dashed in the face of the public 10 years ago," asserted an insurance executive. "Don't be too tactful," he advised, "call a spade a spade." A fruit packer wrote, "I have followed the letters with interest; more power to them."

Aside from their affect on the general public, the letters have come to be a text book for employees of the company, and have set the company's problems and difficulties before its stockholders. Of course, there has been some unfriendly reaction to the letters, always to be expected under such conditions, but it has been much overshadowed by the opposite.

The first letter contained the keynote of the series in the following excerpt:

"I have faith in the fairness of people once they know the facts. It is up to us to furnish you with information to enable you to intelligently decide on the merits of our case and as to whether you would be better off with or without us. The decks must be cleared of passion and prejudice. Therefore I am going to write you from time to time through the medium of the press on matters which I feel are of vital concern to you as a customer of this company and a user of electricity. Regardless of who has the privilege of serving you, we fully appreciate that you are entitled to the best service at the lowest possible cost."

In his second letter the head of the electric utility said:

"Yes, we are victims of the depression and sympathize with our customers who are likewise affected. We have had to search every nook and cranny to find cash with which to pay our bills and meet pressing obligations. However, notwithstanding the limitations imposed by serious financial problems and the necessity of preserving the solvency of the company during this period of distress, our efforts have been to be as helpful as possible to our customers and, as a lot of folks know, we have not been cold-blooded or hard-boiled."

And he added this pointed postscript: "About 16,000 of your friends and neighbors have more than $20,000,000 of their savings invested in this company."

In his third letter Mr. McLaughlin spoke "right out in meeting," about the "tax octopus which is sucking our life blood." He said:

"The taxes paid by this company must come out of its income, and the company's income must come out of your thread-bare pockets through the rates you pay for electricity; yet, you as our customers pay the taxes of this company; there is no escape from it—we have no other source of income. We are simply the tax collectors—and pretty much overworked in this capacity these days. You, therefore, are vitally concerned in the amount of taxes which this company pays."

There is no better way of describing the outstanding manner in which Mr. MaLaughlin is presenting utility facts of public interest to people of his territory than by simply quoting more highlights from his letters. They speak for themselves, and it can be said without fear of truthful contradiction that Mr. McLaughlin pens them himself. The following quotations are keynotes to which he attunes his letters:

Frank McLaughlin

"From the best information available at this time the company's tax bill for 1933 will be about $1,600,000, and for 1934 it will be close to $2,000,000, or almost double what it was in 1932. Just think of that—an increase of around $1,000,000 in two years—an amount almost equivalent to a 10 per cent reduction in all rates for electric service and about equal to our local preferred dividend requirements. It is simply staggering. This is not tax dodging—this is tax catching. **We now have to pay over thirty different kinds of taxes. In the aggregate they amount to about 50 per cent of our operating pay roll. That is to say, for every $2.00 we spend for pay roll we pay out $1.00 in taxes."**

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"In times like these when the whole country is engaged in a gigantic program to build back the purchasing power of the individual and especially when the company is earning less than a fair return on honest property investment, there is no reason why the investors in this company should be singled out for adverse treatment. **They, too need to have their purchasing power restored. They are in the same boat as the farmer and everybody else. They are asking for no more than a fair return on their life's savings, and that they not be deprived of the fruits of their labor. This will be a much better place to live in if we all give each other a helping hand to better days. You cannot build by tearing down.**

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"Our income per kilowatt hour for domestic and farm service is about 70 per cent less now than it was in 1913, while the cost of living is still more than 28 per cent above the 1913 level and is today going up and up. Even during the tough depression years of 1931 and 1932 our electric rates were reduced to the aggregate amount of $1,000,000, which cumulative benefit to customers, of course, has carried on into 1933.

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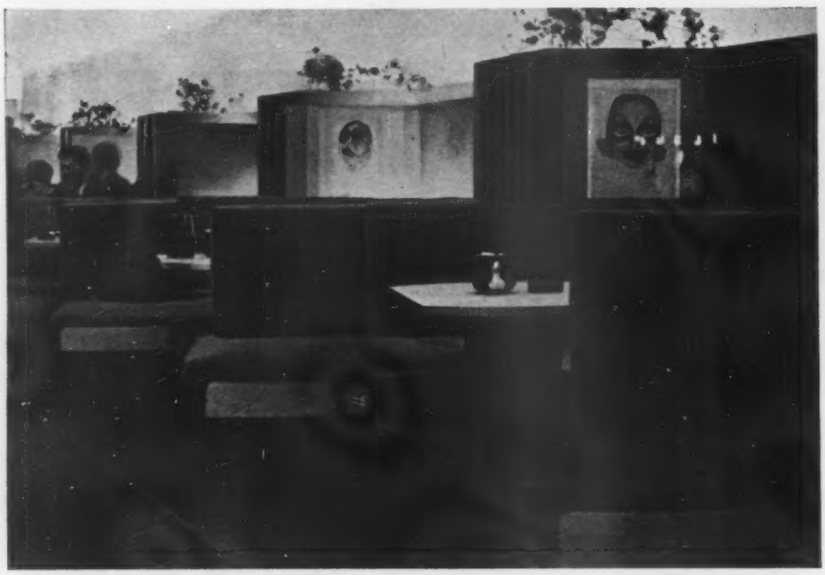
"If it is right that the private companies should be regulated in the public interest, and I fully agree that they should, then why in the name of common sense shouldn't municipal plants be likewise regulated? Certainly all that is wrong is not with the private utilities and all that is good with municipal operation. Both are financed by the public at large and operated by human beings. It does us all good to be checked up from time to time."

Sales of the Month » » »



Soft Light for the Stars

WHERE the stars of Hollywood congregate at meal time it was only natural that something outstandingly bizarre in lighting should be installed. Sardi's on Hollywood Blvd., for which R. M. Schindler, Hollywood architect, produced a modernistic interior, had the assistance of T. H. Shepard, illuminating engineer, Bureau of Power and Light in planning the lighting. All lighting is concealed in the railings which divide the dining area into aisles and booths with heavy upholstered settees. The principal illumination is totally indirect from a cove located behind the wainscoting which surrounds the space. One hundred and thirty-five of such coves are used and 150-watt lamps are spaced on them on 16-in. centers. Light from these is controlled and sent out across the white ceiling area by Holophane lens plates. To give directional light the ceiling reveal is broken at certain places and artificial windows with special sanded plate glass are inserted. Lamps concealed behind these relieve the monotony which might prevail with indirect illumination alone. Total power consumption is 80 kw. which includes the illumination of a luminous facade of more than 400 sq. ft. with the name of the restaurant in silhouette. Commercial Electric Co., of Los Angeles, were contractors with Victor Sayre in charge of installation.

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Edison Co. Sponsors Dealer Sales Course

To prepare the electrical dealers in its territory to take advantage of better business conditions, the Southern California Edison Co., Ltd., has contributed another valuable idea to the industry in its Institute of Store Management and Retail Selling. According to H. C. Rice, manager of the merchandising department of the Edison company, never before has there been such an opportunity for intelligent, well-planned, skillfully directed store management.

To keep electrical merchandisers abreast of the constantly improving methods of retail selling, the Edison company has devised a course covering the eight fundamental factors which control success in store management and retail selling. Each factor is the subject of a lecture given by a member of the faculty of the School of Merchandising of the University of Southern California, under whose supervision the institute is conducted.

The eight lectures in the course cover the following factors: The human side of selling or a practical means of presenting merchandise for its greatest appeal; how to make the most of sales possibilities through building confidence and good will by the merchandiser; how to bring people into a store by effective advertising; how to sell prospects after they are found and specialty selling methods as applied to electrical merchandising; how to use sales aids furnished by manufacturers and wholesalers to the best advantage; profits and how to make them grow, a discussion of inventory, overhead, turnover and other factors in their relation to profitable management; how to use credit and deferred payments as sales aids in building new business and greater profits; how to make service pay, a discussion of service department organization and management.

The course opened February 19, one lecture being given in each of eight Edison districts and will continue weekly with speakers rotating around the districts until the course is completed. A moderate enrollment fee of $10 is charged to each dealer, which fee entitles five employees to admission. This permits the entire organization to take advantage of the course for a nominal sum.

That the course is receiving an enthusiastic acceptance is indicated by the first week's attendance of 800 and a rapid growth in enrollment since that time. This practical presentation of the important phases of merchandising and management applied to the sale of electrical appliances promises to be an important factor in building bigger business and larger profits for Southern California electrical dealers.

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Market Week Draws Large Attendance

OPTIMISM, confidence, and aggressiveness characterized the Western Spring Market Week sponsored by the Western Furniture Exchange and held at its headquarters at 180 New Montgomery St., San Francisco, Feb. 5-10. A program of nationally known speakers addressed general luncheon meetings throughout the week on a program which stressed the need for pushing forward in 1934 toward better merchandising, salesmanship, and advertising as a means of keeping business recovery on the up-grade. Evening sessions during the week were given over to the Western Furniture Institute, a feature of Market Week in which the practical application of better merchandising methods are explained, demonstrated and discussed.

Significant was the increased attention which furniture executives gave electrical appliances. At the Western Furniture Exchange an increased number of appliance exhibits attracted large groups of buyers and furniture men. That the attractive lines of the modern appliance together with the improvement in design of 1934 models of washers, refrigerators, radios and ranges offer a distinct appeal to alert merchandisers was evidenced by their interest in these lines.

The largest registration in past years, definite indications of better retail business conditions, plus an excellent program, all contributed toward making this Western Market Week highly successful. Among the speakers were J. S. Knox, president of the Knox Institute of Business Engineering, Edward A. Filene, president of Wm. Filene's Sons Co. of Boston, George Creel, coordinator for Federal Recovery Agencies in California, and Walter W. R. May, general manager of the Portland Chamber of Commerce.

Refrigeration Bureau Will Be Continued

Plans are now under way for the extension of the activities of the Electric Refrigeration Bureau. An announcement to this effect was made at the New York office of the bureau where it was stated that the program of the activities under its present organization set-up, had been completed up until July 1.

Regarding plans for the second half of the year it was stated that the Refrigeration Division of the National Electrical Manufacturers Association had requested the bureau to draft a tentative program of cooperative activity and submit it to the division at its May meeting. Should this program be approved, either in whole or in part, a budget will be decided upon and funds will be provided for the continuation of the bureau until January 1, 1935.

James E. Davidson, president of Nebraska Power Co., who has acted as national chairman of the bureau since its organization three years ago, has submitted his resignation. At the time he consented to become the head of the bureau it was understood that he would continue to administer its affairs throughout the period of its activity, which was definitely set for three years. This period having ended, Mr. Davidson finds that pressure of other duties makes it impossible for him to continue in active service.

Virtually all of the regional directors of the bureau have already signified their willingness to continue to serve the organization in their present capacity, and many of them have received assurances from their State directors that they will remain in office.

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E. B. & S. Companies Hold Sales Meeting

More than 150 commercial representatives of Northwest client companies of the Electric Bond and Share Co. attended a two-day sales conference in Spokane recently for the purpose of discussing ways and means of increasing appliance and electric service sales.

R. M. Boykin and K. R. McKinnon were chairmen of the meetings. Among the speakers were H. F. Smiddy, commercial manager for Electric Bond and Share Co.; J. F. Fiester, Electric Bond and Share Co.; Frank T. Post, president, J. E. E. Royer, vice-president and general manager, Lewis A. Lewis, assistant general manager in charge of sales, and R. B. McElroy, merchandise sales manager of the Washington Water Power Co.; Paul B. McKee, president of the Pacific Power and Light Co.; Frank M. Kerr, president, Montana Power Co.; P. M. Parry, vice-president, Utah Power and Light Co.; K. M. Robinson, vice-president and general manager, and L. W. Brainard, sales manager, Idaho Power Co.; L. A. McArthur, Pacific Power and Light Co., and J. C. Plankinton, Northwestern Electric Co.

Boosters for air conditioning. From left to right—Harry Eckenroth, N. B. Dinkel, and O. Kindorf of the air conditioning division of Electric Appliances, Ltd.; Harry Carroll and John Wrenn of the Pacific Gas and Electric Co.; L. H. Bennett, president of Electric Appliances, Ltd., and R. E. Fisher, vice-president of P.G. and E.

P.G. and E. Holds Air Conditioning School

With the cooperation of the Frigidaire, General Electric, and Westinghouse companies, the Pacific Gas and Electric Co. held a comfort cooling and air conditioning school in San Francisco, February 26-28, for a selected group of its commercial representatives and salesmen. John Wrenn, air conditioning specialist for the utility, arranged a program which combined the theory and practice of air conditioning installations with pertinent sales and market data.

Included on the program were lectures by E. S. Riley and A. F. Kessing of the Frigidaire Corp.; N. B. Dinkel and L. H. Bennett of Electrical Appliances, Inc.; and F. W. Jordan of the Westinghouse Electric and Mfg. Co. A portion of each day was given over to the inspection of air conditioning exhibits arranged by manufacturers of the equipment.

Why the Kitchen?

1. Managers today are unanimous in their feeling that the way to offset taxation and other burdens is through new kilowatt-hour sales and new revenues—greater consumption of kilowatt-hours per customer.
2. The domestic market offers the greatest field for quick and economical development; and 80 percent of the potential domestic load is in the kitchen.
3. The modern all-electric kitchen, including electric range, dishwasher, refrigerator, water heater, adequate lighting and other equipment, consumes better than 6,400 kw.-hr. annually and the annual revenue is better than $150.
4. When fully equipped, one electric kitchen is better than ten average new customers in terms of kilowatt hour consumption and better than five average new customers in terms of revenue, so that a 10 percent saturation of all-electric kitchens would double the present residential load in kilowatt hours and a 20 percent saturation would double the present residential revenue in dollars.

—Conclusions drawn from a conference of 100 central station merchandising executives at the new G.E. Institute at Nela Park.

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Refrigerator Accessory Shows Planned

"Sandy" Pratt, colorful and original father of the Christmas tree movement in California and proprietor now of the California Electric Refrigeration Co., specializing in accessories for electric refrigerators, service and reconditioning, and the purchase and sale of trade-in refrigerators, is going to apply some of his old merchandising experience to his new products. He is planning a traveling show of refrigeration parts and accessories, for the public, dealers and service men throughout northern California. Each of these shows will be set up in a local hotel. Public, dealers, service men and power company people will be invited and shown the possibilities of these accessories. Advertisements, and help from the power company will be enlisted to bring the public and interested dealers in each locality to the display.

The first such show will be held in Sacramento at Hotel Senator, March 7. This happens to be California's Arbor Day and Mr. Pratt will combine it with a celebration accompanying the planting of a mile of deodars by the city of Sacramento.

Accessories shown will include all sorts of refrigeration dishes, ice crushers, desert trays, ice cream freezers, lights for refrigerators, artificial foods for display, repairing and servicing material and other items.

A New Approach to Load-Building

BACKED by the offer of "free electricity" as a special inducement for immediate purchase, the electrical industry in the territory served by the San Joaquin Light & Power Corp. and Midland Counties Public Service Corp. is planning for one of the most intensive cooperative sales drives in the history of the industry. Every form of promotion will be used, including radio, billboards, direct mail and special newspaper sections, to induce customers to buy the latest electrical appliances and to enjoy the conveniences that these servants can provide. Manufacturers, wholesalers, retailers and contractors are cooperating in the sales campaign which will be launched about March 15.

Revolutionary adjustments of rates to domestic, agricultural and commercial consumers which have been approved by the California Railroad Commission form the basis for the sales drive. The general effect of the new schedules will be to give consumers increased use of electricity for the same amount of money they are now paying and thus effect a reduction in the cost to them per kilowatt-hour consumed.

For a two months period commencing with the April meter readings, domestic and commercial lighting consumers, upon approval of schedules by the Railroad Commission, will be given unlimited use of electricity for a monthly charge not to exceed the amount of the bills paid by them in March.

For the same two months period, agricultural power consumers will be given the right to use power in excess of that used by them last year at half price for the excess used or under certain conditions at no additional cost.

Following the close of the two months trial period, made possible by a temporary surplus of electric energy by the two companies, all domestic lighting consumers will be given opportunity to qualify for the low cooking and heating rate, and thus use more electric current without increasing monthly bills. The cooking and heating rate heretofore has been available only to those consumers having electric ranges and other large appliances.

The surplus capacity making possible the unlimited use plan has been caused by a falling off of more than one hundred and fifty million kilowatt-hours in system load. Distribution system capacity as well as generating and transmission capacity is already available for use.

The exact wording of the "Free Use" section of San Joaquin and Midland Counties domestic and commercial lighting schedules and domestic heating and cooking schedules reads as follows:

Effective April 1, 1934

Free Use: Consumers receiving service on this scehdule will be permitted to make unlimited use of electricity during the period commencing with the meter reading made in April, 1934, and ending with the meter reading in June, 1934, for a monthly amount of not to exceed the amount charged for use during the month ending with the meter reading made in March, 1934. Each consumer will be notified in advance of the dates free use commences and ends. Domestic lighting consumers not receiving service for the entire month ending with the March, 1934, meter reading, will be billed at the regular rate, but in no case more than $5.00 per month. Commercial lighting consumers not receiving service for the entire month ending with the March, 1934, meter reading are not eligible for this offer. As this offer is made for the purpose of showing consumers the advantages of liberal use of electricity for legitimate use, the company reserves the right to limit the amount of unusual or wasteful use in case service to other consumers is impaired thereby.

Each domestic and commercial lighting consumer will be notified the exact date on which unlimited use begins and ends, and also the maximum amount which will be charged regardless of the amount of electricity used. As meters are read continuously throughout the month, the unlimited use period for individual consumers will vary according to the date of their meter reading, but each one will have a full two months regardless of the starting date.

During April and May of this year, agricultural consumers will be charged one half the regular rate for all use in excess of the power consumption during the same period last year. If the total use for the 1934 agricultural year shall exceed 4,000 kw.-hr. per horsepower, the companies will refund the amount paid for the excess use in April and May. Special provision is made for consumers who did not receive service in April and May of 1933.

Great advantage will accrue to domestic lighting consumers from provisions which permit these consumers to qualify for lower rates at the end of the two months period of temporary unlimited use of electricity. Those consumers in this class who use as much as or more than the amount of energy used in the corresponding month of last year, will be billed on the lower cooking and heating rates if the amount of the bill is not less than that paid last year, and otherwise the same amount as last year's bill. Consumers using fewer kilowatt-hours than last year will be charged the regular lighting rate. This will enable such consumers to use a certain amount of additional current without additional cost and the use of further amounts of electricity at a low rate which drops with increased use to as low as one and one-half cents per kilowatt-hour.

The accompanying table based on San Joaquin rates for incorporated territory illustrates how the consumer will gain by the proposed adjustment of rates for domestic service. The table shows the number of kilowatt-hours that various amounts of money will buy under

Reasons for the Plan

By A. Emory Wishon,

President San Joaquin Light & Power Corp.

The plan has been carefully evolved after many months of study. The companies have a temporary surplus of power due to seasonal high water and decreased load.

Business has been in the decline and we are in consequence earning less than was contemplated when rate reductions were effected in 1932. The company is in no position to stand a drastic reduction in income. What we have sought is a means by which we could give our customers more for their money and still maintain our revenues at a necessary level. The plan is based upon these simple facts and with the thought that this privilege of free use for a trial period will demonstrate the value of permanent use.

Greater production per acre of land reduces unit cost of agriculture; greater quantity sales in merchandising makes possible lower prices. The same is true of electricity. Our effort therefore is to increase permanent use.

Effect of Promotional Rate on Bills

Amount of Bill	Number of Kilowatt-Hours				Av. Rate per Kw.-hr.	
	"L" Rate	"D" Rate	Increase	% Increase	"L" Rate	"D" Rate
$1.85	30	30	—	—	6.18c.	6.18c.
2.30	40	43	3	7.5	5.74	5.32
2.75	50	56	6	12.0	5.50	4.92
3.20	60	69	9	15.0	5.34	4.65
4.10	80	95	15	19.0	5.11	4.30
5.00	100	121	21	21.0	5.00	4.13
5.90	120	147	27	22.5	4.92	4.02
6.80	140	173	33	23.5	4.85	3.94
7.70	160	233	73	46.0	4.81	3.30
8.60	180	293	113	63.0	4.77	2.93
9.50	200	353	153	76.0	4.75	2.69

the domestic lighting (L) rate and the cooking and heating (D) rate, the free kilowatt-hours a consumer will get when he qualifies for the D rate and the lower cost per kilowatt-hour under the D rate.

The domestic consumer who already has a range and water heater will be able to secure a rate of one cent per kilowatt-hour after using 170 kilowatt hours per month by installing a load limiting switch or double throw switch between range and water heater.

The new rate plan should give an immediate impetus to the sale of all types of electric appliances and equipment. An energetic sales promotion drive to build permanent load will be carried on by the two companies.

In advance of and during the two months period of unlimited use, special effort will be made to have commercial lighting consumers increase wattage, install additional window lighting, and modernize interior lighting. By doing this in advance of the unlimited use offer, consumers will get two months use of the added wattage without cost.

Active sales promotion will be carried on to induce domestic consumers to learn the great convenience of adequate light and liberal use of appliances during the unlimited use period. This work will be energetically followed up by further endeavor to build up domestic use so that consumers will permanently qualify for the lower cooking and heating rates.

Consumers already having ranges and water heaters will benefit by installing a double throw switch or load limiting switch and with a one cent rate will be excellent prospects for electric air heating and air conditioning equipment.

The plan offers a tremendous opportunity to manufacturers, jobbers, and retail dealers of electrical appliances and materials.

In approving the plan the California Railroad Commission called attention to the situation brought about by the present surplus of power and its future increase by supplies from Boulder Dam and elsewhere.

"Due in large part to the falling off in consumption, the power industry of this state finds itself with production facilities substantially in excess of present demands," the decision says. "The now existing surpluses will be augmented with the coming of power from Boulder Dam and perhaps from other sources. Either the industry must absorb and put to use these present and prospective surpluses or an examination into capital structures will become necessary since existing consumers may hardly, in justice, be expected or required to pay indefinitely a full return upon excess facilities, even though such facilities were provided initially in good faith."

Commenting further upon the proposal of the two companies, the commission states that "the management is to be commended for thus seriously approaching the problem by submitting experimental rates" designed to increase the use of electricity by consumers by a lowering of cost to them. "While it is true that temporary and experimental rates are not without objection," the decision adds, "the seriousness of the situation facing the power industry and the uncertainty of the best route to be followed to accomplish the absorption of surpluses fully justify experiments of the nature proposed."

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Southern Sierras' Promotional Rate

By Albert G. Cage,

Vice-President Southern Sierras Power Company

LOOKING ahead toward the time that Hoover Dam power will be available in Southern California and anticipating the necessity for developing a market for increasingly large amounts of energy, the Southern Sierra Power Co. has launched a plan to encourage a greater use of electrical energy. This plan centers around a promotional rate recently approved by the California Railroad Commission and permits Southern Sierras domestic and commercial lighting consumers to increase their use of electricity over the corresponding month of 1933 at no additional cost.

Consumers continually state that they would use more electricity if a reduction were made in rates, but often this does not work out in practice. The Southern Sierras plan, an outgrowth of conferences between commission and company engineers, actually guarantees a reduced rate to the consumer that uses more electricity and at the same time guarantees the company against a loss in gross revenue which might result from flat reduction in rates.

In the actual application of the plan, the months of year 1933 were selected as the base months upon which to base calculations, and against which the monthly consumption in the future will be measured. A consumer using more kilowatt-hours in any month of 1934 than in the corresponding month of 1933 is entitled both to a free use of additional kilowatt-hours up to a certain amount and the application of the promotional rate to his entire consumption should it exceed the amount stipulated for free use. The base and promotionad rates established for the plan are as follows:

Kilowatt-hours per month		Rate, Cents per Kw.hr. per month	
		Base Rate	Promotional Rate
First	100	9.0c.	8.0c.
Next	200	7.0	6.0
Next	300	6.5	5.5
Next	400	5.0	4.0
Next	1,000	4.0	3.0
All over	2,000	3.0	2.5

Reference to the accompanying tables will indicate the additional use a consumer may enjoy with no increase in cost, and will also indicate the method of billing where advantage is not taken of the full free use.

From the foregoing, it will be seen that the consumer is entitled to a certain number of free kilowatt-hours for the amount of the bill rendered in the same month in 1933. If he exceeds the amount stipulated, the entire consumption for the month is billed at the promotional rate. In order that the consumer may readily understand the charge, there is shown on the face of the monthly bill the customary previous meter reading, present meter reading, kilowatt-hour consumption, and amount of bill. The amount is, of course, figured by the billing department at either the base rate or promotional rate, depending on whether or not the consumer has increased his consumption over the corresponding base month. On the line directly under that on which the above information appears is shown the kilowatt-hour consumption and the amount at the base rate for the corresponding base month of 1933. The consumer can really see that he is entitled to the lower promotional rate if his present month's consumption exceeds that shown for the corresponding base month. Under this plan, however, the bill for the increased consumption at the promotional rate can not be less than the bill for the lower consumption at the base rate, and it has been deemed advisable to have printed on the re-

Effect of Promotional Schedule

Amount of Bill	Kw.-hr. at base Schedule	Promotional Schedule — Kw.-hr.	Free Kw.-hr.	% Increase Use for same cost
$ 1.50	17	19	2	11 8
1.75	19	22	3	15.8
2.00	22	25	3	13.6
3 00	33	38	5	15.2
4.00	44	50	6	13.6
5.00	56	63	7	12.5
6.00	67	75	8	11.9
7.00	78	88	10	12.8
8.00	89	100	11	12.4
9.00	100	117	17	17.0
10.00	114	133	19	16.7
15.00	185	217	32	17.3
20.00	257	300	43	16.7
25.00	330	391	61	18.5
30.00	408	481	73	17.9
40.00	562	688	126	22.4
50.00	750	938	188	25.1
75.00	1,313	1,750	437	33.3
100.00	1,938	2,700	762	39.3
150.00	3,583	4,700	1,117	31.2
200.00	5,250	6,700	1,450	27.6
300.00	8,583	10,700	2,117	24.7

verse side of the bill the base and promotional rates and the following explanation:

"Whenever your use of electricity during any one month exceeds the use during the same month of 1933, the bill for that month is figured at the promotional rate. However, a bill figured at the promotional rate cannot be less than the bill for the corresponding month of 1933 figured at the base rate.

"Whenever your use of electricity for any one month is less than the use during the same month of 1933, the bill for that month is figured at the base rate.

"The year 1933 will be the base year, but if you started receiving service later than January 31, 1933, the promotional rate will not apply until after you have established your base year by 12 months of continuous service."

The following examples illustrate the application of the plan. A consumer who paid $9 for service during a month of 1933 used 100 kw.-hr. For the corresponding month of 1934 for the same $9, he would be entitled to 117 kw.-hr. at the promotional rate, or the free use of 17 kw.-hr., which is 17 per cent increased use. If, however, he used only 110, or 105 kw.-hr. in the 1934 month, his bill would still be $9. If his bill in the base month of 1933 was $100, his consumption was 1,938 kw.-hr., and under the promotional rate for the same $100, he could use as much as 2,700 kw.-hr. in the corresponding month of 1934. This is a free use of 762 kw.-hr., or an increased use of 39.3 per cent for the same amount of money. It will, of course, be understood that where the consumption for a given month exceeds the free use, the whole consumption is billed at the promotional rate.

Both the Railroad Commission and the company realize that certain inequalities will result in the application of the plan; that in some instances customers with large consumptions who fail to increase their use will pay a higher rate than smaller consumers who do increase their use, but the whole plan is predicated on fostering freer use of electricity and rewarding the consumer when he is willing to use more electricity. It is realized that the plan is of an experimental nature and a radical departure in rate making, and although it will not help all lighting consumers, it will help those who are willing to help themselves.

The Southern Sierras promotional plan is patterned after an "Objective Rate" recently adopted by the Alabama Power Co. and approved by the Alabama Public Service Commission and full credit is given that company for the original idea.

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Adaptability and Cost of Electric Heat for Greenhouses

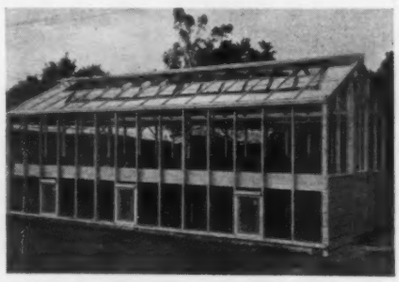
By G. N. HAWLEY*
Industrial Heating Engineer, Southern California Edison Co. Ltd.

IN a mild climate such as obtains in southern California, electric heat has been found to be a highly desirable form of heat for the greenhouse. For frost protection purposes, it is recommended for the largest types of greenhouses. In the smaller houses it can be used for all general greenhouse purposes.

One of its very desirable features is the ease and safety with which electric heat can be controlled. A simple thermostat can be installed that will hold the temperature within one or two degrees of that desired. Thus, the heat is cut off instantly that the house reaches the desired temperature, an important factor in the economy of heating. With a heating installation such as this, no attention need be given the heating problem from one year's end to another. The main switch is left connected at all times and the thermostat turns the heat on and off as needed.

For example, assuming that it is desired to hold a 40-deg. temperature for frost protection and that on a severe winter night the outside temperature drops to 32 deg., the inside temperature without heat will be several degrees higher or around 36 deg. Therefore, the total heat required is enough to raise the temperature of the air in the greenhouse 4 deg. As the thermostat in this case is set at 40 deg., as soon as the temperature within the house starts to drop below 40 deg. the thermostat turns the heat on until the temperature climbs to approximately 41 deg. and then the heat is cut off. It is this close control possible only with electric heat that makes this form of heating so desirable and practical.

The heating apparatus best adapted for greenhouse heating is a heating wire or element enclosed in a conduit or pipe and mounted, usually, immediately under the benches. This pipe enclosing the heating wire can be distributed evenly over the entire house to give a uniform temperature in all parts. This type of heating is very desirable for withstanding the usual wet conditions prevailing in greenhouses.



Typical greenhouse of the type suited for automatic electric heating for protection against frost. A large number of installations of this character have been made in southern California and are giving satisfaction

The heating element or wire best suited for this purpose is asbestos-covered No. 12 Monel wire. The pipe or conduit should be ½-in. galvanized. No. 12 Monel wire has a resistance of .05 ohms per ft. Experience has shown that a dissipation of 37 watts (126 B.t.u.) per foot of pipe is desirable. This will give a temperature of approximately 240 deg. F. on the pipe under the usual operation conditions.

To obtain this condition it is necessary that the exact length of Monel

Most desirable method of installing heating wire is to enclose it in pipes underneath the benches on which the plants or cuttings are growing. Care should be taken to see that the installation is waterproof. No. 12 heating wire is usually used

*Presented at the Rural Electric Short Course, C.R.E.A., Davis, Calif.

Comparison of Costs for Heating Greenhouse 20 ft. x 80 ft. for Frost Protection With Gas or Electric Heat for One Winter Season in Southern California

Cost of Installing Equipment

Electric Heat, $100 Gas, Hot Water or Steam Boiler, $600

Cost of Operation

Electric		Gas	
5,000 kw.-hr. cost	$100.00	37,000 cu. ft. at .60c	$ 22.20
Interest on Investment, 6 per cent of $100.00	6.00	Interest on Investment, 6 per cent of $600.00	36.00
Depreciation, 10 per cent	10.00	Depreciation, 10 per cent	60.00
Total Heating Cost Per Year	$116.00	Total Heating Cost per Year	$118.20

wire be connected on to a given voltage, as follows:

No. 12 Monel Wire	No. of ft.	Voltage	Watts	B.t.u. Input per hour
	80	110	3,000	10,236
	160	220	6,000	20,472

For larger installations multiples of the above lengths can be installed to give the desired heat input.

As most of the heat consumed in greenhouse heating radiates or escapes through the glass, a method of predetermining the amount of heat required, based on the square feet of glass surface has been determined from electrically heated greenhouses now in operation. On an average, the heat consumption will be 0.2 watts per sq. ft. of glass for each degree maintained above the temperature outside. As an example, a greenhouse has 2,000 sq. ft. of glass and holds a temperature of 45 deg. against an outside temperature of 35 deg. for a period of 8 hours. This is a 10-deg. rise above outside temperature.

$$0.2 \times 2{,}000 \times 10 \times 8 = 32{,}000$$

or 32 kw.-hr. consumed during this 8-hour period. With electric energy at 2c. per kw.-hr. this would be 64 cents. With this formula and a knowledge of local temperature conditions, an idea of what it will cost to heat any greenhouse can be had.

The cost of installing electric heating equipment in a greenhouse will usually run between $.60 and $1.00 per square yard of greenhouse floor space. This includes automatic temperature control.

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Soil Heating Wire for Stock and Poultry Drinking Water Heaters

By HOBART BERESFORD
Department of Agricultural Engineering, University of Idaho

STOCKMEN and poultrymen generally consider that herds and flocks should be furnished warm water during the winter months. Due to unpreparedness when cold weather actually comes, there are many frozen water troughs and drinking pans found in the feed lots and poultry houses every winter.

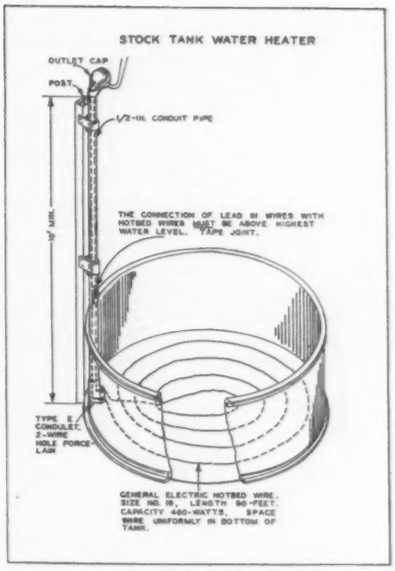
Three years' trials conducted at the Caldwell Substation of the Idaho Agricultural Experiment Station of the University of Idaho have shown that for fattening steers warm water increased the gain per head by 8.9 lb. and at the same time saved 33.9 lb. of hay, 29 lb. of silage, and 16 lb. of barley for each 100-lb. gain made during the feeding period.

In these same trials one lot of ten steers was provided with a shelter shed, the benefit of which was shown to be an average gain of 5.98 lb. per head and a saving of 57.4 lb. of hay, 21 lb. of silage, and 2 lb. of barley for each 100 lb. of gain made during the feeding period.

Warm drinking water and shelter really provide benefits which are not shown in the increased gain or saving in feed. Water troughs that are free from ice means less labor, and shelter means easier bedding and fewer chores.

The relative value of warm water and shelter is dependent upon the weather conditions and cost of feed. The shelter may be obtained from an inexpensive straw type shed, and drinking water may be heated by inexpensive home-made heaters, or there are a number of satisfactory electric, coal, or oil heaters available.

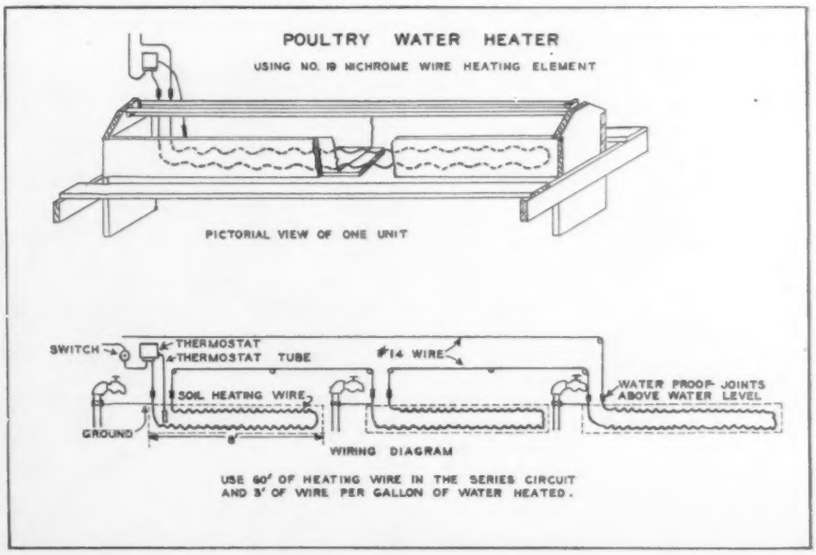
One of the first methods of heating stock drinking water electrically was by means of a standard emersion type heater of 750 to 1,000 watts capacity. Standard pipe fittings or a special thermal head may be used for protecting the wiring leading to the immersed heater.


STOCK TANK WATER HEATER
OUTLET CAP
POST
1/2-IN. CONDUIT PIPE
THE CONNECTION OF LEAD IN WIRES WITH HOTBED WIRES MUST BE ABOVE HIGHEST WATER LEVEL. TAPE JOINT.
TYPE E CONDULET, 2-WIRE HOLE FORCE LASH
GENERAL ELECTRIC HOTBED WIRE, SIZE NO. 19, LENGTH 60-FEET, CAPACITY 480-WATTS. SPACE WIRE UNIFORMLY IN BOTTOM OF TANK.

Details of stock drinking water heating installation showing use of standard 60-ft. length of soil heating cable

A new method of using electricity for stock tank and poultry water heating is by means of the soil heating or hotbed wire. Stock tank heating is required during a time of year when the soil heating wire is not needed in the hotbed. The regular sixty-foot length of lead-covered soil heating wire may be used for heating the average size stock watering tank. The only additional material required is a ten-foot length of conduit pipe with an outlet cap on one end and a type E condulet body on the other.

Construction details of poultry drinking water heater using soil heating cable with wiring diagram for three heaters in series


POULTRY WATER HEATER
USING NO. 19 NICHROME WIRE HEATING ELEMENT
PICTORIAL VIEW OF ONE UNIT
SWITCH
THERMOSTAT
THERMOSTAT TUBE
#14 WIRE
SOIL HEATING WIRE
WATER PROOF JOINTS ABOVE WATER LEVEL
GROUND
WIRING DIAGRAM
USE 60' OF HEATING WIRE IN THE SERIES CIRCUIT AND 3' OF WIRE PER GALLON OF WATER HEATED.

The pipe should be placed in a vertical position with the type E condulet body on the bottom of the tank. A slight bend in the pipe for the purpose of clearing the edge of the tank will facilitate fastening it by means of pipe straps to the supporting post. Two precautions must be observed: first, the connection of the lead-in wires with the heating wire inside of the pipe must be adjusted to a position above the highest possible water level, preferably just above the rim of the tank; second, the lead sheath of the soil-heating wire should be grounded when the application is made in wooden or concrete tanks. If a connection between the circuit wiring and the soil-heating wire should be made below the water level at any time, a short circuit is likely to result. The water heater can be operated by providing a manually-controlled switch placed in some convenient location.

The installation of soil-heating wire in stock drinking tanks requires a minimum amount of labor and has a low initial cost. The total material cost should not exceed $6 providing there is little additional wiring needed. Where soil heating wire is utilized for warming stock drinking water, a small tank of 225-gal. (4½-ft. diameter and 2-ft. high) capacity or less may be found satisfactory. Under average conditions such a tank will require frequent filling which is a decided advantage from the standpoint of preventing freezing and reducing the energy consumption to a minimum.

For the 60-ft. soil-heating wire element, the energy consumption will average about 4 kw.-hr. for each ten hours of use. The usual practice is to turn the water heater on during the night and off during the day. This will keep the drinking water above freezing except in extreme sub-zero weather which may require a day and night operation of the heaters. The convenience and safety features of electric heat are the factors that appeal to stockmen and poultrymen where electric service is available.

There are many simple devices used for poultry water heating. The small electric lamp inserted in a tin can, which has been soldered over a cut out section of the bottom of the drinking water paid has been used. The small immersion type heater and the small electric plate or stove type heater which just fits the bottom of a drinking water pail have all been found satisfactory. Owners of larger flocks have used a galvanized trough 8 ft. long, 8 in. wide, and 6 in. deep with a ½-in. flange around the top edge. One 345-watt space heater controlled by means of a thermostat may be placed in an air-tight box underneath the trough, which just fills the upper part of the box. An overflow drain may be provided in one end of the trough by means of a screw-in pipe, which when removed permits easy cleaning. A great deal of time and labor can be saved by providing the water supply through an automatic float valve.

The advantage of the thermostatic control, as used in connection with poultry water heaters is that the temperature of the drinking water never exceeds 50 deg. F., even though the water in the trough was lowered to within an inch or less of the bottom. This is not the case when the small stove type heater is used, for as the amount of the water decreases, the temperature rises until rapid evaporation occurs and there is danger of having the drinking water too warm.

The disadvantage of the thermostat is the additional expense which makes its use impractical except on the large watering troughs. For the small pans or pails, the immersion or clamp-on heaters are more convenient. If these heaters are to be used in connection with insulated pails or troughs, a 100-watt element will prove satisfactory for maintaining four to five gallons of water at a temperature increase over the atmosphere of approximately 40 deg. This means that for the very cold weather, less water can be handled by a given heating element if the 40- to 50-deg. temperature is to be maintained.

The soil-heating wire may be used in poultry water troughs by simply wiring shorter lengths of heating element in series. For instance, if three small troughs are to be heated, the 60 ft. of wire should be cut into 20-ft. lengths and the electrical circuit between the heating elements completed with the insulated copper wire. The bulb type thermostat which is used for controlling hotbed temperatures may be used also for controlling the temperature of the stock tank or poultry drinking water.

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Rural Electric Course Via Radio

By C. J. HERD
Assistant Agricultural Engineer,
Oregon State College

Approximately 250 students in 13 high schools having Smith-Hughes agricultural classes and 100 farmers in various parts of Oregon have a better understanding of rural electrification as a result of a radio course conducted over Oregon State College station KOAC last spring. New and improved methods of using electricity on the farm, many of which were foreign to farmers and instructors alike, formed the basis of the course. Much of the subject matter was developed by the college experiment station in cooperation with the Oregon Committee on the Relation of Electricity to Agriculture.

Financed by the Oregon state system of higher education, station KOAC, rated at 1,000 watts, is located on the college campus. Daylight reception is afforded to approximately 75 per cent of the radio receivers in Oregon. The station maintains a daily (except Sunday) 12-hour schedule of programs based on subjects covering all branches of work offered by the college, the state university and normal schools.

It was with this background that Clyde Walker, associate professor of agricultural engineering, and the writer instigated this radio course in rural electrification. Seventeen half-hour lectures were given, about half on the fundamentals of electricity and the balance on rural electric applications. In order to simplify the procedure of giving cost figures, basic factors and the like, mimeographed outlines of each lecture were sent to the instructor in advance for distribution to the students, as well as a copy of the complete lecture so that he could continue in case of interference or other reception trouble. The instructor also received suggestions for related classroom or shop work. Rural representatives of the power companies in each district helped in assisting the instructor with equipment demonstrations and field trips.

The students took a keen interest in this new method of instruction. Tests given before and after the course showed a satisfactory increase in their understanding of electricity and its application to farm equipment.

High school class at Silverton, Ore., listening to a radio lecture on rural electrification

All Colorado Centers On Sales Rally

THINGS electrical are humming in Colorado, Wyoming and New Mexico, with Electrical League of Colorado and Rocky Mountain Electrical Assn. the twin dynamos furnishing power to drive the year-around Sales Rally merchandising campaign.

In prospect, the most important activity to include dealers, jobbers, utilities and other Sales Rally participants, is the yard and garden lighting contest, launched by R. M. E. A. and sponsored by the Rocky Mountain News. Scores of new installations to illuminate estates, driveways, parks and homes are already in the planning stage. This activity is part of the comprehensive Sales Rally program and contemplates the invasion of a broad field for general lighting about the home, for social pleasures, sports, recreation and protection, as well as beautification.

▼

Increased Sales 477 Per Cent

In its travel of more than 12,000 miles, crossing the continental divide four times, the kitchen coach of the General Electric Supply Corp., of Portland, claims to have increased dealer sales in its territory 477 per cent over those of the preceding year. Utility business in the territory was 153 per cent better than last year, which gives the dealer business extra importance.

These figures are results of the experience of H. D. Alton, who has operated the coach in Oregon, Washington, Montana, Utah and northern California. More than 15,000 people visited the coach last year, of which number 1,100 were good prospects for a refrigerator, 430 for a range, 222 for a dishwasher, 79 for a complete electric kitchen, 154 for a washer, 190 for an iron, 63 for a mixer, 18 for cleaners, 15 for sunlamps, 10 for water heaters, 8 for radio and 8 for kitchen fans. Turned over to dealers, most of these prospects were actually sold.

▼

Cooperative Sales Drive for Glendale

Cooperative merchandising plans for 1934 involving range trials, free wiring, servicing, display, sales promotion, financing and other features have been announced by the Glendale (Calif.) Water, Power & Light Department, through A. W. Krueger, director of merchandising. Objects are to build mass public acceptance of electrical household equipment, to build load for the utility and business for the retailers and contractors.

Outstanding feature of the program is the plan to place 500 trial ranges plus as many direct sales of ranges as possible on the lines of the utility during the year. The department will have available for trial or optional sale late model approved four-unit ranges with temperature control and optional time control. Trial fee will be $1.50 per month with an additional charge of 25 or 50 cents per month for manual or all-electric timer, respectively. Minimum trial period will be six months and a $9 deposit will be collected to cover the initial period in the case of lessees. At the end of 12 months or before, all trial fees will be credited to the purchase of the trial range or a new range. Dealers will be paid a $10 commission for securing an approved trial agreement.

Trade-in allowances of $10 in the case of purchase of a range or $4.50 in the case of a trial installation have been set up in the program. Wiring will be furnished without charge by the department where average requirements apply and new home builders will be given a $20 allowance where a range is installed for daily use.

The department will create and maintain a complete display of electric appliances including a model electric kitchen. The services of a home economist will be available to all retailers. A feature of the plan is the requirement that all ranges sold be equipped with a polarized plug and a 36-in. service connection.

Direct sales by the department will be confined to ranges and water heaters and these will be purchased from cooperating dealers at a discount of 25 per cent from the manufacturers list price. Salesmen of the department will be compensated on the basis of load added to the lines and not merchandise commissions.

A study is being made to determine the practicability of a trial water heater plan and activity on this appliance will be announced later. Air heating will be promoted by the department but sales will be made by the trade.

Efforts to gain one hundred per cent industry acceptance of all electrical appliances, particularly ranges, will be one of the objectives of the program.

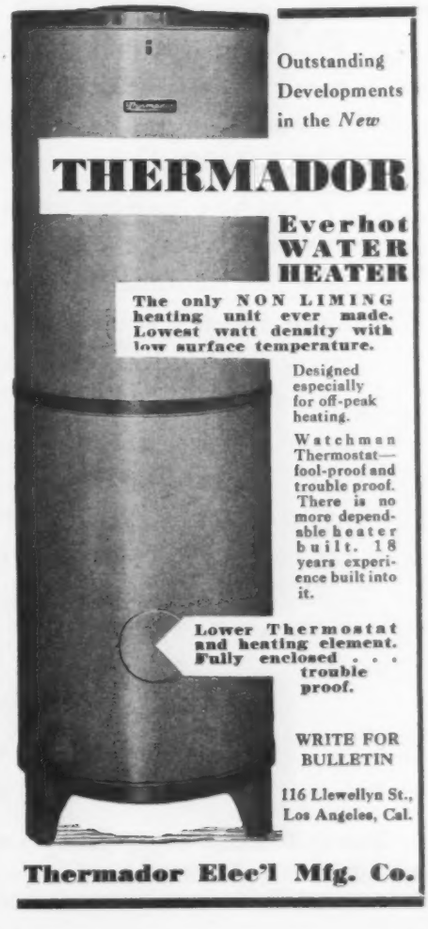
▼

Newell Heads Colorado League

The Electrical League of Colorado has re-elected Charles S. Newell as president for another year. J. C. Davidson and O. L. Mackell, secretary and treasurer, respectively, are also "repeat" officers.

Tradition that Electrical League executives shall not be asked to serve an additional term was ignored because the present incumbents are thoroughly familiar with all plans laid by the Electrical Industry Sales Rally leaders. Their continued service was deemed vital to success of the Sales Rally schedule.

Vice-presidents are L. A. Vosmer, J. J. Cooper, R. G. Gentry and H. A. Fluckey, who head the contractor-dealer, manufacturers, utility and distributors divisions, respectively. Among this quartet, Messrs. Cooper and Fluckey are new.


Outstanding Developments in the New
THERMADOR
Everhot WATER HEATER
The only NON LIMING heating unit ever made. Lowest watt density with low surface temperature.
Designed especially for off-peak heating.
Watchman Thermostat—fool-proof and trouble proof. There is no more dependable heater built. 18 years experience built into it.
Lower Thermostat and heating element. Fully enclosed . . . trouble proof.
WRITE FOR BULLETIN
116 Llewellyn St., Los Angeles, Cal.
Thermador Elec'l Mfg. Co.

Color Helps Sell Washing Machines

That color plays an important part in the merchandising of electric washing machines and ironers is the opinion expressed by Harold Taylor, manager of the L. C. Taylor Co., Pasadena, Calif., electrical appliance dealers, specializing for sixteen years on washers. This opinion was expressed after a few months' experience with a change in the company's merchandising policies which resulted in their handling the product of six manufacturers instead of concentrating their effort on the product of one.

"When we handled only one make of washer, we had washers of only one color," Mr. Taylor explained. "However, that is not the sole reason for our changing our policy; there were other factors, but since we have washers of six different colors we found that color exerts some influence upon the housewife.

"Primarily we changed our policy so that we might take more advantage of customer pre-selling through the national advertising of the manufacturers, and thereby reduce selling costs. It is obvious that if the manufacturer's advertising does anything, it influences a reader to buy his make of washing machine. When she comes into a sales room of an electrical dealer, she wants to see a machine like she saw advertised in the magazines. If the dealer doesn't carry that make, she is not willing to buy another make until she has seen the other; and therefore she will go elsewhere in search of it. With six different makes displayed on our floor, we have six opportunities to cash in on the manufacturers' national advertising, and six chances of preventing a customer from going elsewhere after she has come to us first—unless she's a shopper.

"But, getting back to color schemes, we find that by watching the visitor as she moves from the door toward the center of the sales room, and noting which color washer holds her attention most, we can determine which make of washer to demonstrate thoroughly, or determine the color scheme of the place where the new washer is to stand. The modern woman carries color harmony not only from the living room to the kitchen, but also to the back porch. If it is a case of a home demonstration, we prefer to demonstrate the washer that comes nearest to harmonizing with the home color scheme, unless the visitor specifies a washer of a particular make.

"When we call on prospects at their homes, we often can obtain permission to demonstrate a washer in the home by mentioning that we have one that will fit in wonderfully with the color scheme of the back porch, or wherever the machine is to be stationed.

"In arranging the floor and window displays, we strive to range washers so that the various colors will stand out prominently, one from the other, yet not clash."

▼

Radio Guessing Contest Gets Prospects

Radio sets were featured in the February advertising and promotion of the Bureau of Radio and Electrical Appliances of San Diego County. Washers ironers and waffle irons were also featured in the advertising carried. Billboards during the month were devoted exclusively to ironers. Likewise, county newspaper advertising was devoted to ironers.

The radio campaign centered around radio broadcasting of eight 15-min. periods from station KGB. A theme song guessing contest designed to send people into the stores of dealers handling radio equipment was conducted. A picture of the favorite radio star was given to contestants correctly identifying the four theme songs. Pictures for winners were delivered from the stores themselves, giving dealers a second opportunity to contact contestants, according to J. Clark Chamberlin, executive secretary of the bureau.

▼

¶ **Music and dramatic** sketches feature the "Electric Half Hour," a new radio program on station KHQ each Sunday evening, under sponsorship of Washington Water Power Co. Short announcements of appliance specials and features carried by the company and cooperating dealers are made in connection with this program.

CONGRATULATIONS

To the management of the
Pacific Gas and Electric Co.
and the
San Joaquin Light & Power Corp.
on the voluntary rate reductions

• YOU have again taken THE LEAD in new low inducement domestic rates.

You have moved the NATION'S YARDSTICK WESTWARD.

You have sounded the keynote of REVIVAL FOR AN INDUSTRY, encouraging your own employees, and providing unlimited opportunity for alert electrical contractors, dealers, wholesalers, and manufacturers to sell and install electric ranges, water heaters, and electric air heaters.

You have STARTED THE TREK forward to a fuller use of electrical service.

TRUE TO TRADITION, you have written the DW rate so that it is UNDERSTANDABLE.

You have made it cheaper to use electricity than not to.

Your deserved reward will be INDUSTRY CO-OPERATION, CONSUMER COMMENDATION, and INCREASED REVENUE.

WESIX, INC.

San Francisco Los Angeles Seattle

G. E. Supply Corp. Opens Fresno Branch

Recognition of the importance of Fresno as the distribution center for the lower San Joaquin Valley is given by the General Electric Supply Corp. as the reason for the establishment of a new wholesale distributing branch in that city. The new Fresno quarters add 11,000 sq. ft. to the company's extensive distribution facilities, which, in California alone, now include seven wholesale distributon offices and warehouses, located in San Francisco, Oakland, Sacramento, Los Angeles, Long Beach and San Diego. This latest branch, which opens March 12, is located at 1117 N St.

It will be operated as part of the San Francisco district, of which F. C. Todt is district manager. Complete stocks of wiring devices and appliances will be carried. In addition, there will be a display room which will be available for use of all dealers in the territory.

Personnel will consist of F. M. Koch in Fresno and B. F. Bennett in the outside territory, both of whom have been handling sales in the valley for some time. K. N. Edwards has been transferred from the San Francisco office to be in charge of general service and F. M. Wilkins has been transferred from Sacramento to handle radio service.

▼

Frigidaire Road Conventions Again

Frigidaire dealers and salesmen from coast to coast will meet late in February and early in March with officials of the corporation to hear the company's 1934 selling and advertising plans. Four flying squadrons of men made up from the national headquarters executive staff will visit thirty-six key cities on road show schedules in order to convey the 1934 plans to the field forces in the shortest possible time.

Frank R. Pierce, sales manager, will head up the party making the swing westward. Members of his crew are: R. B. Ambrose, retail commercial sales manager, A. D. Farrell, manager of window displays and exhibits, Ellsworth Gilbert, general sales staff, and R. W. Pocock, public utilities division.

This group will open at Denver, Colo., and play Salt Lake City, Utah, on the way to the Coast. Other meetings will be in Los Angeles, San Francisco, Portland, Ore., Seattle, Spokane, and Billings, Mont.

According to R. G. Hutchinson, Pacific Regional manager, this year's Frigidaire conventions surpasses in spectacular settings, stage skits and interesting sound motion pictures, the best Frigidaire ever has put on.

▼

Extending its trial plan on ranges and water heaters even to its employees, J. H. Warden, sales manager of the El Paso Electric Co., reports the plan going over very successfully. The employee offer provides a range for $1.75 monthly for 50 months and a trade-in allowance of first three months rental for old equipment. On a 30-gal. water heater the monthly charge is $1.50 with similar trade in allowance. On a 50-bal. water heater the monthly charge is $1.75.

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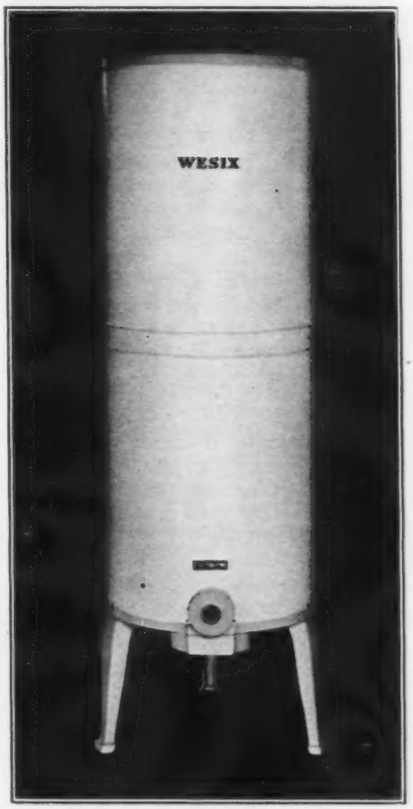
Refrigerator distributors and wholesalers of northern California have just formed an association.

▼

All Industry Conference—In the past, Electrical League of Colorado's All Industry conference has concerned itself with affairs inside the state boundaries. This year the convention is scheduled to become a tri-state event, instead of being confined to Colorado alone, with representations from Wyoming and New Mexico attending. The affair is held in conjunction with the Western Section, International Association of Electrical Inspectors. April 23-24 are the tentative dates assigned.

▼

Included in the 1934 program of Frigidaire is an educational school to be held in every distributing office in the country for installation and service department personnel. It started in February and continues for two months. The three phases of activity, household, commercial and air conditioning, are covered.



HERE'S HOW . . .

Electrical contractors, dealers, and wholesalers can sell water heaters with real profit in the domestic market now being stimulated by the new low electric rates.

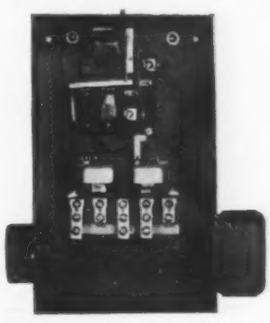
Wesix automatic electric water heaters have led the field for 14 years. This storage type heater, of true Wesix quality, was designed particularly to meet the demand created by the new domestic rates of the Pacific Gas and Electric Company and San Joaquin Light and Power Corp.

The price is a real inducement for your customers to buy now—practically one-half the former list.

WESIX AUTOMATIC ELECTRIC WATER HEATER

WESIX AUTOMATIC DEMAND CONTROL

THE automatic demand control is another of the famous Wesix products. When installed in conjunction with an electric range and electric water heater, it entitles the user to the new low electric rates offered by the Northern California utilities.



WESIX, INC.

SAN FRANCISCO LOS ANGELES SEATTLE

About Folks in the

Selling Game

G. L. Sammis Leaves Sunset Electric Co.

Liquor has claimed another good electrical man in the person of George L. Sammis, for many years vice-president of Sunset Electric Co. in Seattle and manager of the Portland branch of that concern. Mr. Sammis resigned from the company on Jan. 1 to become administrator for the state liquor commission which will administer Oregon's new liquor law by the establishment of state stores for the sale of liquor above 14 per cent.

Mr. Sammis is succeeded at Sunset Electric Company in Portland by A. L.

A. L. SHELLWORTH

Shellworth, who, since 1930, has been sales manager for the company in Seattle. For two years previous to that time Mr. Shellworth was sales manager in Portland, having come to Portland in 1928 from Spokane, where he was in the chain store grocery business.

Sunset Electric Company distributes Frigidaire, L. & H. ranges, Atwater Kent radios, and certain automotive lines in the Portland and Seattle territories.

▼

¶**Ed Shea and Hal Borin**, formerly with the City of Paris, department store, electrical appliance department, have taken over the radio and electrical appliance concession of Weinstein's main San Francisco store.

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¶**O. F. Welch**, long associated with H. C. Capwell Co., department store of Oakland, has accepted a position as promotion manager of the Norge department for Leo J. Meyberg Co., Los Angeles. Mr. Welch paid a visit to the Norge factory in preparing for the new work.

¶**J. H. Warden**, sales manager of the El Paso Electric Co., has been elected president of the Electrical League of El Paso for the year 1934.

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¶**J. L. Buchanan**, president of the General Electric Supply Corp. with headquarters at Bridgeport, Conn., made his annual tour of General Electric Supply offices on the Pacific Coast during February. Mr. Buchanan also attended the N.E.W.A. divisional meeting at Del Monte.

▼

¶**John L. Busey**, manager of sales, Appliance Division, Merchandise Department, General Electric Co., with headquarters at Bridgeport, Conn., spent some time on the Pacific Coast during February. This was Mr. Busey's first trip to the coast since he left the headquarters office of the Western region of the corporation at San Francisco in the latter part of 1919 to become manager of the Boston district of the organization.

▼

¶**George K. Throckmorton**, executive vice president of RCA Victor and RCA Radiotron companies, was a recent visitor to the Pacific Coast.

▼

¶**James S. Remick Co.**, of Sacramento, has been appointed distributor for "Prima" electric washer for Sacramento and San Joaquin valleys. Waterhouse-Lester-Scovel Co. distribute to the balance of northern California.

▼

¶**J. N. Etienne**, manager of electric appliance department for Chanslor & Lyon Stores, recently paid a visit to Crosley factory and the Automatic Electric Washer factory in the East.

▼

¶**E. G. Cunningham**, president of RCA Victor and RCA Radiotron companies and well known in Pacific Coast circles, was a recent visitor to the Pacific Coast.

▼

¶**G. E. Culliran**, president of the Graybar Electric Co., Inc., with headquarters in New York, visited the Pacific Coast during February and conferred with the managers of the various Graybar offices in this territory. Mr. Cullinan expressed optimism over the outlook for the electrical industry, particularly as regards the sale of all types of domestic appliances.

▼

¶**Reese Mills**, manager of the range division of the Merchandise Department of the Westinghouse Electric & Manufacturing Co. with headquarters in Mansfield, Ohio, gave a highly encouraging picture of the range market during a trip to the Pacific Coast in February. After contacting power company commercial managers in this territory, he predicted that range sales during 1934 would exceed those of either 1932 or 1933.

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¶**H. R. Basford Co.** has been appointed northern California distributor for Kelvinator electric refrigerators.

¶**C. W. Hartenfels**, recently in charge of range and refrigerator sales for the General Electric Supply Corp., Portland, Ore., was transferred to Dallas, Texas, to have charge of the refrigeration department of General Electric Co. in that district. Mr. Hartenfels came to Portland with the Laidley Co. in 1930 when that company took over the distribution of G.E. refrigerators in the Portland territory. In the fall of 1932, when the G.E. Supply Corp. took back the distribution of G.E. refrigerators and Hotpoint ranges, he was one of the Laidley organization who went to the Supply Corp.

▼

¶**L. A. Iserman** succeeds Mr. Hartenfels in the Portland office of the Supply Corp. Mr. Iserman was also formerly with the Laidley Co., and will manage the range and refrigerator department in the Portland district.

▼

¶**A. E. Allen** has been elected vice-president in charge of the Merchandising Division of the Westinghouse Electric & Manufacturing Co. Prior to his election, he was vice-president of the Westinghouse Lamp Co. Mr. Allen has been with various divisions of the Westinghouse company since 1902. P. S. Youngholm has been elected vice-president of the lamp company to succeed Mr. Allen.

▼

¶**Bon Clark**, vice-president and general manager of the Westinghouse Electric Supply Co. with headquarters in New York, visited Pacific Coast offices of his company during February and attended the annual meeting of the Pacific Division of N.E.W.A. at Del Monte.

▼

Topper

R. M. Vieths, of Montana Power Co., Missoula, Mont., (extreme left) was one of the fortunate G.E. Toppers to make the Bermuda Island cruise given to top-notch salesmen by the General Electric Co. not long ago. Mr. Vieths brought along his Montana Power Co. steed, battered but still going strong

¶ **Godfrey Strelinger,** sales manager, and Sam C. Mitchell, advertising manager, of Leonard Refrigerator Co., Detroit, Mich., conducted a series of dealer sales meetings for the purpose of discussing the company's sales program for 1934 in various Pacific Coast cities during January and February. Meetings were held in San Diego, Los Angeles, San Francisco, Seattle, Portland, Phoenix, Spokane, Boise, Salt Lake City and Denver. At all of the meetings the prediction was made that 1934 would be a banner refrigeration year with the likelihood that sales would exceed those of 1933.

▼

¶ **General Electric Contracts Corp.** has opened a Pacific Coast district office at 235 Montgomery St., San Francisco. J. C. Sauer has been appointed manager. Before coming to the Pacific Coast, Mr. Sauer was in charge of the Philadelphia office of the company. Prior to that he was affiliated with the Merchandise Department of the General Electric Co. R. E. Boian has been named district auditor of the corporation.

▼

¶ **Hughes & Co.,** wholesale plumbing firm of Spokane, has been appointed distributor for Leonard electric refrigerators for eastern Washington, northern Idaho and western Montana. E. H. Hughes, president of Hughes & Co., announces the appointment of Frank J. MacDonald as head of the new refrigeration department.

▼

¶ **The Merchandise Department** of the General Electric Co. has announced the organization of a new sales district on the Pacific Coast with headquarters at Salt Lake City. E. W. Brown, formerly salesman in the Western regional district, has been appointed sales manager.

▼

¶ **Crowson Electric Agencies,** 156 Ninth St., San Francisco, will represent the **Warmerirn** line of electric soldering tools in the Northern California territory. E. A. Crowson, head of the concern, was associated with the Graybar Electric Co. for many years and is well known in the electrical industry on the Pacific Coast.

▼

¶ **A. E. Clarke,** of Smoot-Holman Co., Inglewood, Calif., has announced the appointment of J. Edwin Roberts, 805 Blaine St., Seattle, Wash., as a representative of Smoot-Holman Co. in the states of Oregon and Washington.

▼

¶ **McCormick Electric Shop** moved from 471 Broadway in Pasadena to 400 South Fair Oaks Ave. not long ago.

▼

¶ **Seattle Electric Appliance Co.** re-recently moved from 4336 Brooklyn to 604 Pine St.

▼

¶ **J. A. Ribblet** announces the moving of the Ribblet Electric Co. from 6036 Pacific Blvd. to 2950 Walnut St., Huntington Park.

New Lines *You Can Sell*

All-Night Lamps

The Incandescent Lamp Department of the General Electric Co., Nela Park, Cleveland, Ohio, has developed two types of all-night lamps of 3-watt capacity. The light they emit provides illumination intensities comparable to moonlight. They are made with standard prongs that plug into any baseboard or other convenience outlet. Adding the screw part of a standard attachment plug permits them to be used in any regular socket. The smaller size lamp has an output of approximately one lumen while the larger size has an output of 12½ lumens.—Electrical West, March, 1934.

▼

Portable Washer

Landers, Frary & Clark, New Britain, Conn., has announced a new Universal portable washer known as Model No. 50. It is equipped with a solid copper tube, nickel plated inside. It operates on the agitator principle. Capacity is the equivalent of approximately two sheets or 2 lb. of dry clothes. It has an over-all height of 18 in.—Electrical West, March, 1934.

▼

New Kelvinators for 1934

Kelvinator Corp., Detroit, Mich., announces four lines comprising 16 domestic models with a number of new features for 1934. The Deluxe line consists of six models ranging in size from 6.58 cu.ft. to 23 cu.ft. The "P" line contains four porcelain-finished models and the "S" line three models and the "N" line also three models. Among the new features is the new "food filing system," consisting of three entirely separate refrigerated drawer-like compartments suspended from the lower shelf in the food compartment. The new line has a new control system which includes automatic return to operation after defrosting.—Electrical West, March, 1934.

▼

"Ohioan" Range

The Standard Electric Stove Co., Toledo, Ohio, has announced a new model electric range known as the "Ohioan." It is a standard sized model of the buffet type and is finished in ivory porcelain enamel with black striping. Standard equipment includes a utensil cabinet to which may be added a warming closet, a range light and a clock.—Electrical West, March, 1934.

▼

1934 Waldorf Range

Electromaster, Inc., Detroit, Mich., has developed a new Waldorf electric range known as Model K-44. It is a buffet type model and is finished in platinum-gray porcelain enamel. It includes a utensil drawer which operates on rollers. Standard equipment consists of one 2,000-watt surface element and three 1,200-watt surface elements with a 2,200-watt oven element. On order the company will build Model K-43 which is identical to K-44 except that it has only three surface elements.—Electrical West, March, 1934.

New Hotpoint Appliances

The Merchandise Department of the General Electric Co., Bridgeport, Conn., has just announced the addition of three new appliances to the Hotpoint line. The first is the "Treasure Chest Cooker," which toasts, broils, grills and fries in a convenient and economical manner. It is finished in chrome plate and is equipped with Calrod units which are located close to the 7x10-in. grids. Retail price is $9.95. Second appliance is the "Black Knight" toaster which embodies a modernistic design in contrasing chrome and black satin finishes. It has a rating of 470 watts and is priced to sell at $3.50. Last of the new line is the "Salisbury" waffle iron which is built with a large tray base and a rim to catch batter overflow. It is finished in chrome plate and has a heat indicator on top. It is priced at $6.50. All three of the appliances are equipped with the new scratch-proof fibre feet. In addition, the company has developed a new "Redman" display table for use on floor or in window. It is designed to display six appliances.—Electrical West, March, 1934.

▼

Lights and Plants

The Duplexalite Division of The Miller Co., Meriden, Conn., has developed a line of specially designed "Plant Lites" to meet the current trend of combining decorative lighting with growing plants. Five attractive models, all of the modernistic type, are included in the new line. Two are wall hanging types, two are table types and the third is a floor lamp.—Electrical West, March, 1934.

▼

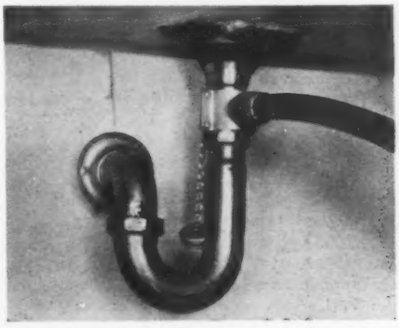
Truck for Farm Motors

The Rockwood Mfg. Co., Indianapolis, Ind., has produced a portable power truck for operating farm machinery. It is built to accommodate both single and polyphase motors up to 10 hp. at 1,800 r.p.m. It is built so that the motor is mounted on a pair of free-swinging pivot arms so that the weight of the motor is lightly cradled in the belt when the drive is running. This method of mounting gives practically automatic control of belt tension.—Electrical West, March, 1934.

▼

Washer Drain

Designed by an electrical dealer who has dealt with the problem for years, (R. C. Evans, of Los Altos), but manufactured for him by William Brower & Co., 220 Rinconado Ave., Palo Alto, is the Ezy-Drain fitting for laundry trays or sinks for the emptying of washing machines. As shown in the illustration, it is clamped on to the drain above the trap. A cutting tool, provided with it, cuts through the drain. When the washer hose is disconnected a waterproof cap screws over the aperature. Parts are made of cadmium plated metal, and are rust proof. Retails at $1.00. Can be used with hose under pressure for flushing drain also. Electrical West, March, 1934.



The Month

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Commercial and Sales--

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If your set is growing WHISKERS
S'AWFUL
-its reception is fuzzy too·
An up-to-date radio set is not merely simpler to tune in...its tone is incomparably better. Find out from your dealer how radio has advanced in the past two years. Lower prices... easier terms.
Southern California Edison Company Ltd.

DEALER HELP—A "reminder advertisement" which the Southern California Edison Company Ltd. carries in local newspapers to help stimulate radio sales for dealers in its territory

PRIZE WINDOW—This display captured a $100 first prize for Tull & Gibbs, Spokane, Wn., in annual window display contest held by the Electric Refrigeration Bureau. Southern Colorado Power Co., Pueblo, Colo., also took first prize for central station window displays in the contest

RECOGNITION—Washing machines win main floor display space at the John Breuner Co., Oakland, Calif., furniture dealer

SOLID COMFORT—Charlie, orang-outang in Fleishhacker Zoo, San Francisco, agrees the electric heat is best. He and his tropical brothers in the Zoo recommend it for health and comfort

in Pictures

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--Engineering and Construction

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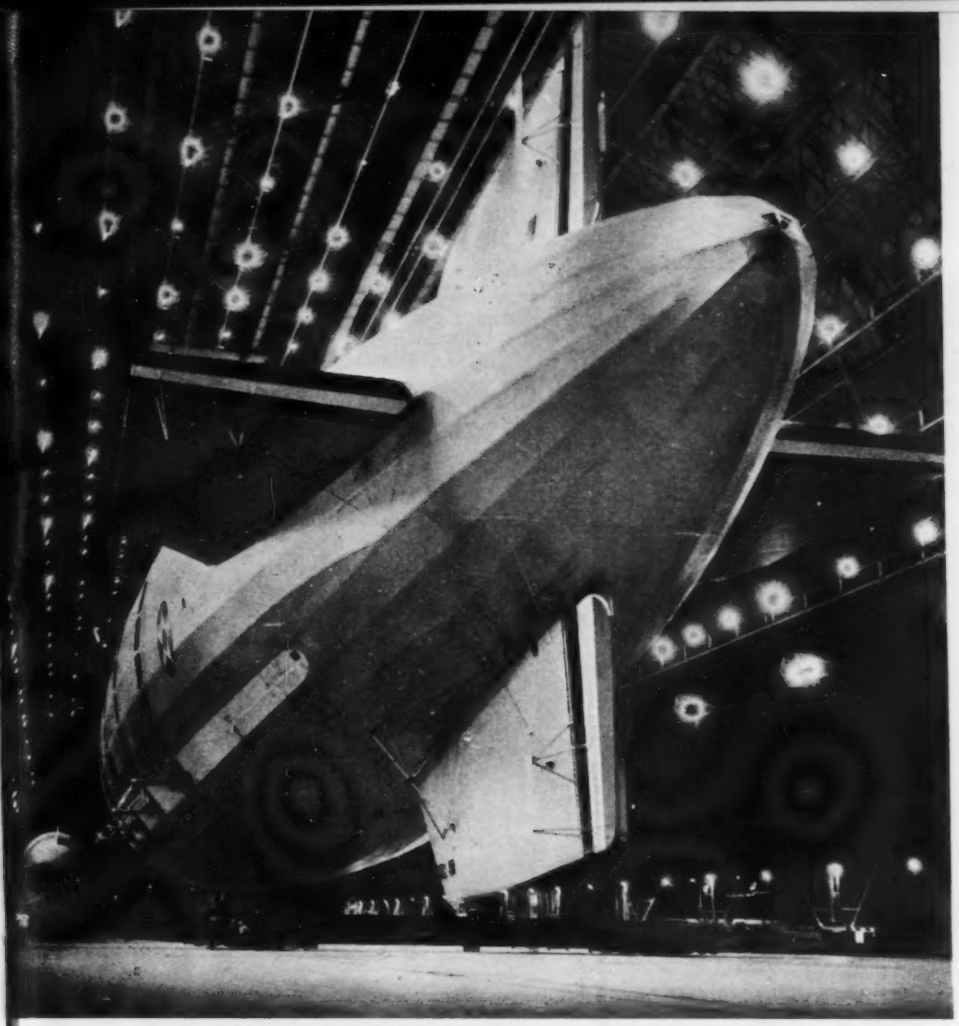
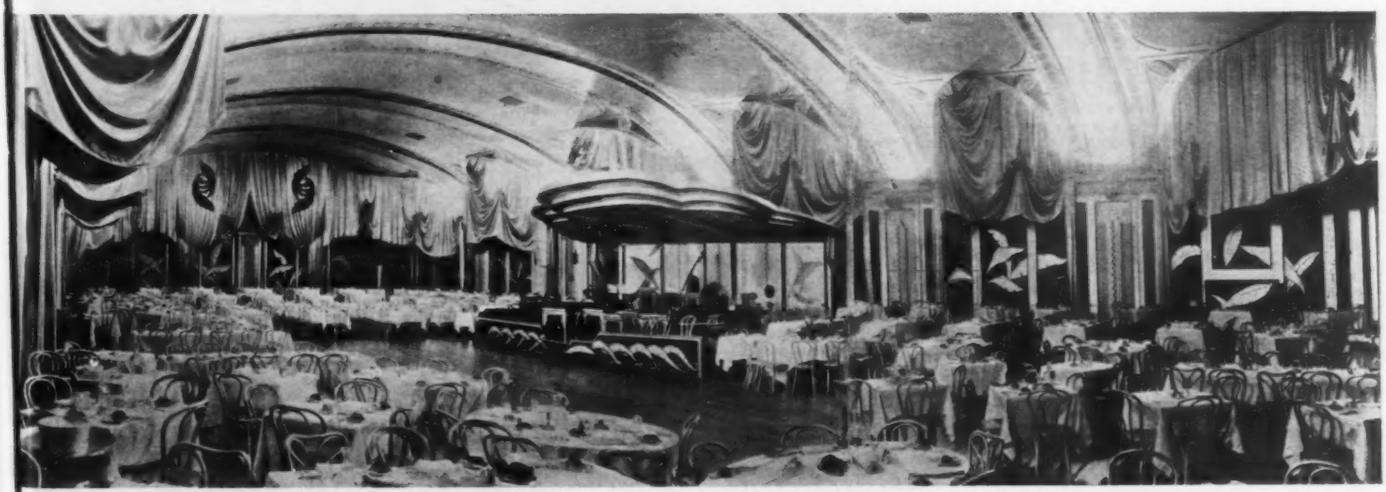


AT HOME—The U.S.S. "Macon" in her hangar at the U.S. Naval Air Station, Sunnyvale, Calif. Electricity plays an increasingly important role in National defense. *(See Page 34.)*

NO LITTLE BOY BLUE—The cows are kept out of the corn by a new one-wire fencing unit. A single strand of barbed wire, charged with just enough energy to "tickle" the beast, is reported to cut fencing costs 80 per cent. The energizing device, operating from a 110-volt circuit, is produced by the One-Wire Fence Co. of Whitewater, Wis. — another of electricity's many contributions to the farm

LIGHTING MAGIC — John Sovis, New York engineer and artist, redesigned and re-decorated this dining room in the Cosmopolitan Hotel, Denver, Colo. Lighting effects play an important part in creating the rich, artistic decorative scheme



Engineering of the Month

COCINAS ELECTRICAS THERMA

FABRICACIÓN SUIZA

Ultimos modelos con todos los perfeccionamientos, patentados, de la técnica moderna Limpieza fácil - Hornillos y resistencias de los hornos instantáneamente desmontables Departamento caliente-platos - Interruptores de cuatro graduaciones de calor, completamente protegidos para cada hornillo y horno, y con manecillas reversibles a ambos lados

Núm. 2132

Núm. 2131

Núms. 2121 - 2722

Cocinas tipo plano, sin horno

N.º del aparato	Hornillos de 220 mm.	Consumo watios	EJECUCION	Precio Pesetas
2152	1	700-1800	Parte superior y chasis negros, barnizados al fuego. Guarniciones finamente niqueladas.	
2155	2	1400-3000		

Hornillos de		En cada cocina un horno de	EJECUCION A		EJECUCION B		EJECUCION C		Consumo total en watios
180 mm.	220 mm.		Núms.	Precio Pesetas	Núms.	Precio Pesetas	Núms.	Precio Pesetas	
1	2 1	ancho 320 mm. alto 240 » prof. 400 » 1400 watios	2921 2922		2921 2922		2721 2722		4400 4100
1 2	3 2 1	ancho 320 mm. alto 240 » prof. 450 » 1600 watios	2926 2927 2928		2926 2927 2928		2726 2727 2728		5800 5500 5200
1 2	4 3 2	ancho 320 mm. alto 240 » prof. 450 » 1800 watios	2931 2932 2933		2931 2932 2933		2731 2732 2733		7000 6700 6400

Cocina mostrando la disposición de los interruptores en su parte posterior

Ejecución A. — Placa superior negra, chasis gris obscuro, barnizado al fuego, guarniciones negras.

Ejecución B. — Placa superior negra, chasis gris obscuro. barnizado al fuego, guarniciones niqueladas.

Ejecución C. — Placa superior pulida, chasis esmaltado en blanco, guarniciones niqueladas.

Las cocinas **THERMA** son inmejorables por su calidad y perfección

Cocina con la parte superior levantada, facilitando su limpieza

Representantes exclusivos para España: Dominguez y Serra, en Cta. Calle Mallorca, 327 BARCELONA

European Engineers Make Complex Rate Structures

By H. C. EDMAN*

Power Sales Engineer, San Joaquin Light & Power Corp.

MUCH has been said about the intricacy of rate structures used in the United States, but even with all their demand, service and block energy charges they are but primers of first principles when compared to those in use in foreign countries. With attention here on the Pacific Coast directed to the formulation of promotional rates that will encourage the maximum use by residential customers, particularly the engineer and commercial man will find interest and amusement, and perhaps ideas as well in the rate structures of some of the European nations. At least for complexity and intricacy many of these rates have no parallel in this country.

Practically all foreign rate schedules are based upon the demand or service charge form of rate with variations and adjustments in profusion. So intricate and detailed are some of them that it is almost impossible to compute with any degree of accuracy the cost of energy over a given period of time.

In Germany the service charge is based generally on the number of rooms in the house. In one of the Berlin rates the service charge for two rooms and kitchen is 1.25 Marks (29c); for four rooms and kitchen 2 Marks (47c.); for six rooms and kitchen 4.25 Marks ($1.01), etc., with energy at the rate of 15 Pfenings (4c) for the first 50 kw.-hr. per room and 10 Pfenings (2½c.) for the balance.

In Darmstadt the service charge is 60 Pfenings (15c) for each main room (i.e., living room, dining room, kitchen, etc.) plus 30 Pfenings (7½c.) for each secondary room (bath, guestroom, servants' room, etc.). Energy costs 10 Pfenings (2½c.) per kw.-hr.

In some localities the service charge is based on installed capacity; for instance, in Siegmar 48 Pfenings (12c) per month per 50 watts, and in Theringen:

40 Pfenings (10c.) 25 to 200 watts,
35 Pfenings (9c.) 25 to 400 watts,
30 Pfenings (7½c.) 25 to 800 watts, etc.

Lighting and cooking energy in Coblenz is metered separately at the rate of 40 Pfenings (10c.) per kw.-hr. for lights and 10 Pfenings (2½c. for cooking, plus .8 Pfenings (1/5c.) and .4 Pfenings (1/10c.) for each mark that the price of coal exceeds 20 Marks ($4.70) per ton.

In Holland the service charge is generally based on floor area. In Amsterdam this is complicated by using a different factor per square meter for each type of room, together with a different factor for each month of the year.

The Rotterdam consumer pays 3.12 florins ($1.25) per sq.m. per year (spread over the 12 months and varying each month). For this service charge an average of 13 kw.-hr. per sq.m. (varying for each month) is allowed with a charge of 6 cents (3c.) per kw.-hr. for all over this amount.

In Zaandam the normal usage for the previous three years is used as a base, and energy charged for at the rate of 27 cents (13c.) per kw.-hr. and all over this amount at the rate of 8 cents (4c.) per kw.-hr.

In Leyden the service charge is 18 cents (9c.) per month for each light outlet with energy at 10 cents (5c.) per kw.-hr. for the first 106 kw.-hr. (varying for each month) and 5 cents (2½c.) per kw.-hr. for all over this amount.

In Switzerland at most places the service charge seems to have been lost sight of and rates are generally higher during the winter months than in sum-

*Based upon material translated from "Electric Cooking," a publication of the Royal Hydro-Electric Commission of Sweden.

†Throughout the article the figures in parenthesis represent American money on the 1932 gold dollar basis.

mer. However, double, triple and even quadruple metering equipment is used in some places to differentiate between usage during various periods of the day. For instance, in Lausanne the 24 hours is divided into four periods representing various degrees of load on the system. During the high load period the rate is 64.5 centimes (13c.) per kw.-hr., during the next highest 34.125 centimes (7c.) per kw.-hr., during the next to the lowest 10.5 centimes (2c) and during the lowest 3.75 centimes (.7c.) per kw.-hr. The article mentions that this is a meter manufacturer's paradise.

In Bern there is a service charge of 8 Francs ($1.60) per year per kw. connected load, plus an energy charge during the winter of 50 centimes (10c.) per kw.-hr. during the lighting period of the day, 8 centimes (2c.) during the day and 4 centimes (1c.) during the night after the normal lighting period is over. During the summer the kw.-hr. charge is 50-4-2 (10-1-½) centimes respectively.

In France, because of the various factors taken into consideration, it is generally necessary to adjust the rate quarterly.

For instance, in Paris there is a base price per kw.-hr. which is adjusted by three factors: the price of coal, the salary of the consumer and a tax, i.e.:

Base price	0.50 Franc	(1.8c.) per kw.-hr
Coal Price	.42 Franc	(1.5c.) per kw.-hr.
[Coal at 175 Francs ($6.50) per ton]		
Salary factor	.18 Franc	(.7c.) per kw.-hr.
Tax	.22 Franc	(.8c.) per kw.-hr.
	1.32 Francs	(5c.)

This is complicated by further segregation according to usage. Consumers are divided into three groups depending on kw.-hr. used per kw. of connected load. The second and third group earn rebates as follows:

2nd group, 30 per cent on base kw.-hr. price and on salary figure and 15 per cent on coal price;

3rd group, 50 per cent and 20 per cent as above.

In Strassburg the following formula is used for the lighting rate:

$P = .0042 (C - 80) + .034 (S - 3.00)$.

P represents cost per kw.-hr., C price of coal per ton, and S the salary per hour.

A supplementary rate is used for cooking which is based on the figure arrived at for lighting. For instance:

Lighting	Cooking
.81 to .83 Franc	.40 Franc
.84 to .86 Franc	.41 Franc
.87 to .89 Franc	.42 Franc

In England a variety of rate forms are used, from a maximum demand form at Gloucester to a simple rate at Cambridge of 7 pence (14c.) for all lighting (separate meters) and for all other uses 4 pence (8c.) for the first 400 kw.-hr. per year, and 1½ pence (3c.) for all over.

In Heston (London) the service charge is £7-10 Shillings ($36) per quarter per kw. for 30 per cent of the connected load, with energy at 1½ pence (3c.).

In Scotland, in the city of Glasgow, the tax assessor steps into the picture. The service charge is 12.5 per cent of the rental value (determined by the assessor) plus ½ pence (1c.) per kw.-hr. and for night usage only ⅜ pence (¾c.) per kw.-hr.

Where electricity is used for heating the rate varies with the price of coal. The sale of wiring and equipment in Glasgow is handled in a novel manner. A low down payment is required and the balance due is paid for by adding a certain amount, say 2 pence (4c.) per kw.-hr. to the regular rate.

In Sweden there is considerable variety. For cooking, this is brought about by the fact that there are two separate types of ranges used. One is the type used in this country and the other is what might be termed a heat storage range. In the latter an element of only 300 to 600 watts is used, enclosed in a large block of iron weighing 90 to 150 lb. Temperatures up to 450 and 500 deg. C. are reached. The elements are of course left on almost continuously and a high quality of heat insulation is necessary. Because of the low wattage required, the rate for this type of range is lower than for the direct heating type.

In Upsala the rate is 12 Krown ($3.22) per year per room and 7 ore (2c.) per kw.-hr. In Enkoping the rate is 10 Krown ($2.68) per year per room and 10 ore (2½c.) per kw.-hr. in winter and 5 ore (1¼c.) in summer.

In Boros the rate is 10 Krown ($2.68) per room per year and 8 ore (2c.) per kw.-hr. for the first 200 kw.-hr. per room and 6 ore (1½c.) for all over this amount.

In Stocksund the rate is based on kw.-hr. consumption per quarter. In this city the consumer is billed on what would result in the lowest bill when figured quarterly on the following rates:

1. Energy used less than 50 kw.-hr. per quarter.
   Service charge—2.50 Kr. (67c.) per quarter and 35 ore (49c.) per kw.-hr.
2. Energy used between 50 and 250 kw.-hr.,
   Service charge—12 50 Kr. ($3.40) per quarter and 15 ore (4c.) per kw.-hr.
3. Over 250 kw.-hr.,
   Service charge—30.00 Kr. ($8) and 8 ore (2c.) per kw.-hr.
4. For night usage, especially water heating, between 11 p.m. and 6 a.m.,
   Service charge—5 Kr. ($1.34) and 3 ore (¾c.) per kw.-hr.

In Stockholm the service charge is 200 Krown ($54) per kw. per year with energy served through a type of load limiting meter which results in a charge of 15 ore (1¼c.) per kw.-hr. up to a certain load and 27 ore (7c.) per kw.-hr. for all over that amount. A 15-min. maximum demand meter is used to determine the service charge in some of the cities.

In a **Norwegian** survey, made by one of the commission's engineers, the following interesting statement is made in comparing Swedish and Norwegian rates: "In Norway most electric service is from publicly-owned plants. As a result rates are constructed on social and political bases instead of economic ones. Deficits, if any, are taken care of by local taxes and when these are insufficient the central government helps out with low interest and in some instances interest free loans for amortizing such deficits." In Norway flat rates and straight kilowatt-hour rates are used extensively, although two part rates as alternatives are coming into use. For instance, in Stavanger the rate for cooking is 2.2 ore (½c.) per kw.-hr. in summer and 4.4 ore (1c.) per kw.-hr. in winter. As an alternative, another rate has a service charge of 60 Kr. ($16) per kw. per year and an energy charge of 1 ore (¼c.) kw.-hr.

It is interesting to note that in both Norway and Sweden motors used on farms are charged for at a flat charge per year based on the area of the farm. As an example, the following in Haaland, Norway, for a 5-hectare farm:

Service charge:
- 345 ore (70c.) per kw. per year for lighting
- 50 ore (10c.) per kw. per year for ironing and small appliances
- 100 ore (20c.) per kw. per year for water heating
- 11 Kr. ($2.25) per hectare per year for small motors

Energy 6 ore (1.2c.) per kw.-hr. for cooking.

After seeing what the European consumer puts up with in the way of meter reading and billing, one cannot help but feel that the United States has gone a long way toward simplification of rate structures. Two significant facts are apparent from this survey. The first is the utter impossibility of predicting with any degree of accuracy the energy costs of a piece of apparatus over a given period of time which, in turn, must make the power salesman's life miserable when trying to sell energy in competition with other forms of power. The second is the obvious impossibility of trying to compare the rates charged for energy in one country with those of another. The latter suggests the thought that projects involving the issue of municipal ownership must be argued out on their economic merits and not be clouded by comparisons with the rates in neighboring or distant countries.

▼

Completion of the first major farm service extension for some considerable time was recently reached by the B. C. Electric Railway Co. The extension was on Lulu Island, B. C., and linked twenty-four large farms and a peat plant with light and power services, while running service lines through new territory. The project cost $13,000 and required 187 poles, a carload of wire and thirty transformers. Many of the new customers are installing motors for feed grinding, silo filling, etc., while others are electrifying poultry houses, and of course introducing domestic appliances.

Electrical Features of the U.S.S."Macon's" Home

U. S. Naval Air Station, Sunnyvale, Calif., Incorporates Many Applications of Engineering Interest in Its Power Supply and Hangar Lighting

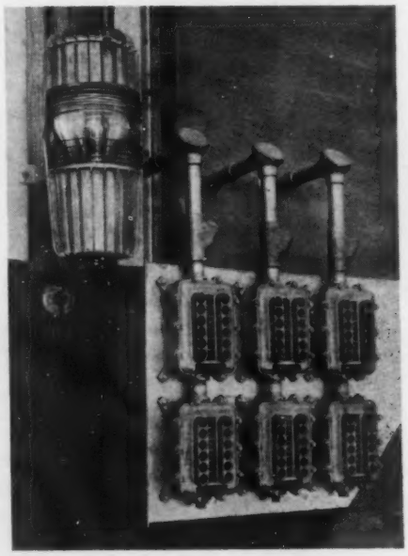
Main switchboard supplying power to the 2,300-volt primary distribution system of the U.S. Naval Air Station, Sunnyvale, Calif. At the extreme left may be seen four synchronous motors which drive a group of compressors through short-center, V-belt drives

A CITY complete in itself with residences, street lighting, industries and recreation, the U. S. naval air station at Sunnyvale, Calif., is an excellent example of the manner in which electricity may be adapted to the requirements of modern industrial practice. Wherever possible, electricity is used from a central source of supply but it is significant that on mobile equipment, such as the mooring mast and stern beam, mechanical power, transformed into electric energy to improve its flexibility of application, is used.

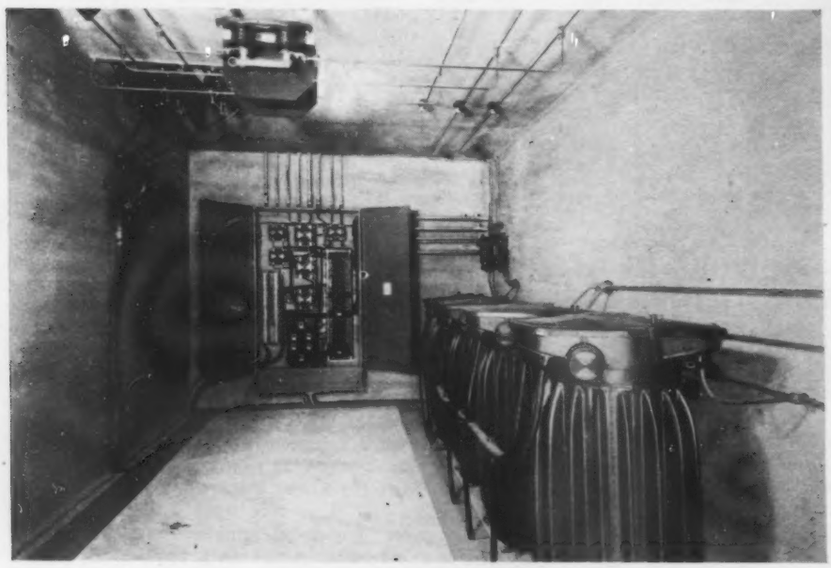
The main source of energy at the air station is the 11-kv. transmission system of the Pacific Gas and Electric Co. From a small outdoor-type substation located on the south side of the property, 2,300-volt power is carried underground to the main station switchboard. Metering is accomplished from 2,300 volts at the substation which has a capacity of 900 kva. The maximum demand for the air station ranges from 300 to 500 kw. with a consumption ranging from 60,000 to 90,000 kw.-hr. per month. From the 20-panel main switchboard located in the compressor room power is distributed at 2,300 volts to various load centers. The main distribution system is entirely underground, consisting of conduits in concrete served from 39 underground transformer vaults.

Most of the activity is centered around the mammoth hangar which houses the navy's newest airship, the U.S.S. "Macon." In the hangar, shops, storage rooms, and offices are located along the outer edge of the hangar on the ground level. The structure itself is 1,133 ft. long, 208 ft. wide and 194 ft. high, one of the largest buildings yet constructed without columnar supports for the roof.

Six transformer vaults, three on each side of the hanger, spaced approximately 500 ft. apart, supply light and power. Primary wiring and switching arrangements are provided so that any vault can be switched in or out of service from a loop system on the 2,300-volt supply. Five of the vaults contain one 75-kva., single-phase transformer for lighting and three 75-kva. transformers for power; in one, three 50-kva. transformers are used for power. The remainder of the equipment in each transformer vault consists of the necessary busbar system, disconnecting switches, potheads, cable connections, and a distribution center containing six remote electrically operated switches controlling fused lighting circuits. All local power circuits fed from the distribution transformer vaults are 230-volts, three-phase, 60-cycle with local



A remote control pushbutton station controlling the hangar lighting. Three substations are provided, from each of which the entire lighting installation in the hanger can be turned on or off. On the column is a Fresnel lens floodlight typical of those used for lower level lighting in the hangar



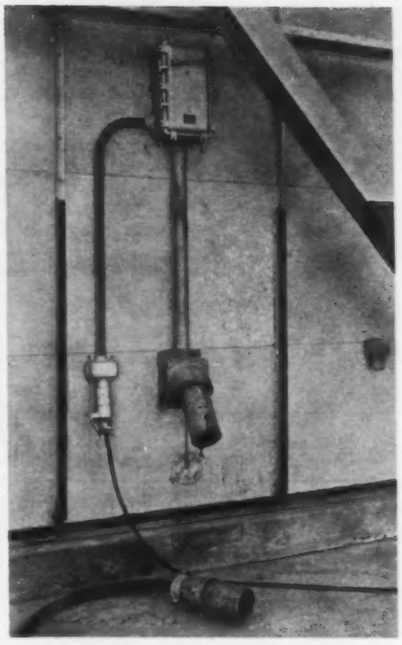
Typical hangar transformer vault. Three of the transformers supply 230-volt, three-phase power, the fourth 115/230-volt lighting. In the distribution cabinet note the use of terminal boards, for convenience in repairs and for sectionalizing controls, and the electrically operated switches for remote control of the lighting circuits

lighting circuits at 150/230-volts, three wire. Over one hundred motors are required for operation of the shop equipment which includes an interesting 1,500-lb. capacity elevator traveling on a curved set of rails up the west side of the hangar, and is so arranged that the car floor is always maintained at a level position regardless of its location on the inclined curved tracks.

Hangar doors are of the orange-peel type, pinned at the top and arranged to roll on nine sets of heavy four-wheeled trucks. These trucks support the 550-ton weight of each door and are operated by a 75/150-hp. wound rotor induction motor equipped for automatic acceleration. Twelve minutes are required to open a pair of doors with an expenditure of approximately 16 kw.-hr. of energy. Power for the various processes and machinery in the hangar is transmitted by means of fiber underfloor ducts which are designed for access at frequent intervals. In the steel superstructure of the hangar, circuits are carried in conduits mounted in the channel iron members of the framework.

One of the most important operations is the inspection and repair of the "Macon" when it is in the hangar. To facilitate this, there are nine catwalks between the floor and the peak of the roof. A high intensity lighting installation insures adequate illumination on the exterior of the ship.

Lighting units used for illuminating the outside of the ship when at rest within the hangar are mounted at several levels between the floor and the peak of the roof. The lighting system incorporates several different types of reflectors and is designed to give a uniform intensity of ten foot-candles on the exterior of the ship.



Safety first! Vaporproof and explosion proof fittings and equipment are used throughout the hangar. Here are three specimens of different size plugs together with an explosion proof switch which are typical of the installation

The principal items of this lighting system are twenty-four 1,000-watt Westinghouse special Fresnel lens units which are mounted on the first level and arranged to diffuse the light both under and above the mounting height of the unit. Above these on the second level are fifty-two 1,500-watt Crouse- Hinds 24- in. enclosed floodlight projectors. At the intermediate levels above these are mounted twenty-six 750-watt Crouse-Hinds 16-in. diameter enclosed floodlight projectors and seventy-six 500-watt projectors of a similar type. Shops, storage rooms, and the mezzanine floor of the hangar are illuminated with 283 300-watt and 174 500-watt vapor proof RLM domes.

Hangar lighting is controlled from three groups of pushbutton controls located at three stations mounted along the west wall of the hangar. These station controls are in multiple and all lighting in the hangar can be turned on and off from any one of three stations. Each pushbutton box contains twelve pushbuttons, a group of six pushbutton boxes comprising a control station.

Exterior lighting for the landing field is provided by two 1,000-mm. Sperry floodlights, one mounted at each end of the hangar in a small cupola house 35 ft. high. These flood lights, mounted on turntables so that a 180-deg. swing can be obtained, are equipped with high intensity carbon arcs with a 10-kw. incandescent lamp which automatically swings into focus if for any reason the arc fails. These will light the landing field three-quarters of a mile in all directions. In addition, neon ground signs will tell incoming pilots of the direction and velocity of the wind.

The grounds surrounding the hangar are lighted by a modern street lighting installation of 57 6,000-lumen street lighting units mounted on concrete electroliers. Lighting units are equipped with reflectors and are staggered at 200-ft. distances along the curb line of the street of the air station.

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Unique Hydro Plant to Be Erected As Part of Bridge River Development

By C. E. BLEE
Principal Assistant Engineer, B. C. Electric Railway Co., Ltd.

PLANS and specifications are now being prepared and field work is under way on the construction of a 4,600-hp. hydroelectric plant to supply the rapidly developing gold mining industry in the Bridge River Valley, some 150 miles north east of Vancouver, B. C. This development is being undertaken by the Bridge River Power Co., Ltd., a subsidiary of the British Columbia Electric Railway Co., Ltd., at the site of its proposed Bridge River Plant which will ultimately have an installed capacity of 500,000 hp. The 2½-mile tunnel together with the intake structures was completed at the end of 1930 and all construction work was closed down at that time due to load conditions.

The reason for calling the present plant a temporary one lies in the fact that it will be so arranged and designed that it will not interfere with the later installation of the main units of the Bridge River Project.

The general scheme of the project involves the utilization of the Bridge River tunnel, an essential part of the greater project as both a conduit and a regulating forebay for the temporary plant. Water will be pumped from a canal leading from Bridge River to the tunnel intake and the work and expense of a diversion dam will thus be avoided. The canal will conduct the water by gravity from the river channel to the pump setting at the tunnel intake. At the outlet end of the tunnel the water will be drawn through a 22-in. steel pipe and delivered to the turbine on the shore of Seton Lake under a head of about 1,090 ft. About 60 c.f.s. of pumping capacity will furnish water for the generation of 4,600 hp. at the power station.

The tunnel and its intake are submerged to an extent that pumping will be required for only about eight months of the year. During the remaining four months water from the river will flow by gravity into the tunnel. The level of the intake channel will be depressed to conform with the bottom of the river channel thus permitting draft below the ice sheet which will be formed in winter and reducing ice troubles to a minimum amount.

Two 18-in. screw impeller pumps, capacity 30 c.f.s. each, direct connected to a 100-hp. motor are projected for pumping equipment. Pumps will be set on the lower cross beams of the existing gate cylinder at the tunnel intake. The maximum pumping head will not exceed 10 ft.

A steel bulkhead will be installed in the concrete lining of the tunnel near the outlet portal to form an intake to the penstock and provide forebay ca-

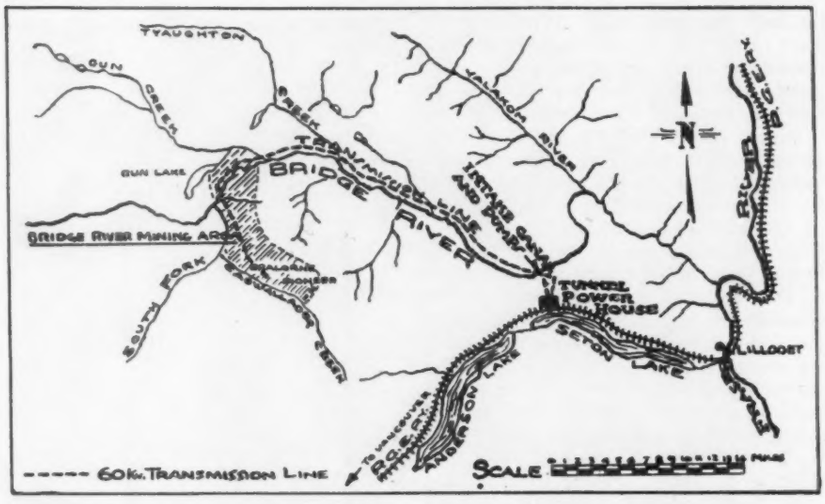
pacity in the tunnel for emergency storage and load regulation. It is estimated that about 12 hours of storage will thus be afforded for the full operation of the 4,600-hp. unit.

A 20-in automatic gate valve will be set at the bulkhead from which the 22-in. steel penstock will extend some 2,700 ft. to the tunnel portal and down the hillside to the power house. This valve will be actuated by water pressure and will be designed for automatic closing in case of penstock trouble. Its location in the tunnel will remove any danger from freezing conditions and the tunnel storage back of the bulkhead can be relied upon for actuating pressure. Alternatives covering welded and riveted pipe will be considered. Expansion joints and air valves will be provided.

The generating unit will comprise a 4,600-hp. horizontal single overhung impulse wheel direct connected to a 5,000-kva. a.c., 2,300-volt generator running at 400 r.p.m. This complete hydroelectric unit and its appurtenances now comprising the No. 1 unit of the company's Jordan River Power Station on Vancouver Island will be dismantled, moved and re-erected at the Bridge River Plant. This unit will be placed in the building formerly housing the Diesel engine plant which furnished power for the construction of the tunnel.

The generator voltage will be raised to 60,000 volts by three 1,400-kva. transformers which will similarly be removed with the hydroelectric unit from the Jordan River Plant.

The most expensive item of the project is the transmission line. This is planned as a 60,000-volt single pole 3-wire circuit line extending from the power plant a distance of about 43 miles to load center of the mining district. No. 1/0 A.C.S.R. conductor on pin type insulators is being considered. Pole spacing will average about 450 ft. The project will be completed about July 31, 1934.



Map showing location of the Bridge River Plant of the B. C. Electric Railway Co., Ltd., and the route of the 60-kv. line to serve new mining load

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Penstock Maintenance Costs Repaid in Two Years

Los Angeles Department of Water and Power Refinishes Penstock Interior and Reduces Friction Losses

Painting the inside of penstocks to reduce friction losses and to extend the life of the pipe is a recently developed hydraulic technique of the Los Angeles Department of Water and Power. During the past year forces of the department successfully cleaned, primed, and enameled two of the three penstocks leading to the San Francisquito Plant No. 1 and the Bee Canyon siphon in the main line of the Los Angeles aqueduct between San Francisquito power plants Nos. 1 and 2. A combined area of over 100,000 sq.ft. was represented in the job.

Before cleaning, the reduction in head loss in the penstocks was estimated to vary between 18 and 28 per cent, which, if capitalized at proper energy charges at the plant under average operating conditions, would more than pay for the entire painting operations in two years. The line had been in service over fifteen years prior to the present painting and indications are that fully twenty years of life may be expected before similar conditions will warrant maintenance of this sort.

Both the penstocks and siphon consisted of riveted and welded pipes of diameters varying from 54 to 84 in. As originally proposed, the cleaning was to be done in a series of week-end shutdowns from Friday midnight to Monday noon. Actually the work was accomplished by shutting down one line completely until the entire painting was finished.

Preparatory to the actual cleaning operations, two 16-in. manholes were installed in the penstocks and twenty-four 4-in. flanged forged nipples were installed at appropriate intervals for air-hose connections. Exhaust fans and heaters maintained proper ventilation in the penstocks for efficient and safe-working conditions. Cat walks and platforms were installed in steep sections to assist the workers.

Each man working in the penstocks was supplied with goggles, a dust res-

Painting the interior of a penstock reduces friction losses and prevents corrosion. Los Angeles Department of Water and Power calculates cost of this maintenance will be repaid in two years

pirator, and a canteen. Tools included a specially designed scraper, a flat wire casting brush, a 1-lb. scaling hammer, and a curved-back painter's wire brush per man. In addition, one Ingersoll-Rand No. 16 L, air-driven scaling hammer with a special throttle was available for scaling more difficult sections around joints and butt straps. Six Ingersoll-Rand air-driven rotary multivane grinders were also supplied together with various types of wire brushes for use with them. Illumination was provided through 50-watt lamps in weather proof sockets fed through two-conductor Tirex cable.

After the interior of the penstock had been thoroughly scaled, brushed and cleaned, a priming coat of Bitumastic solution cut to the proper consistency with Bitumastic thinner was applied hot. Forty-eight hours after the application of the priming coat a Bitumastic enamel was applied at 475-deg. F. with dauber brushes, the thickness of the enamel being equivalent to one-half a pound per square foot. Enamel was kept hot by the use of special electrically heated 750-watt buckets.

Bee canyon siphon, with an area of over 35,000 sq.ft., was cleaned and painted in a similar manner. With the exception of the enameling of the two penstocks, the work was done by the construction division of the Department of Water and Power. So successful was the treatment that cleaning and painting the penstocks at San Francisquito Plant No. 2 will be undertaken in the near future.

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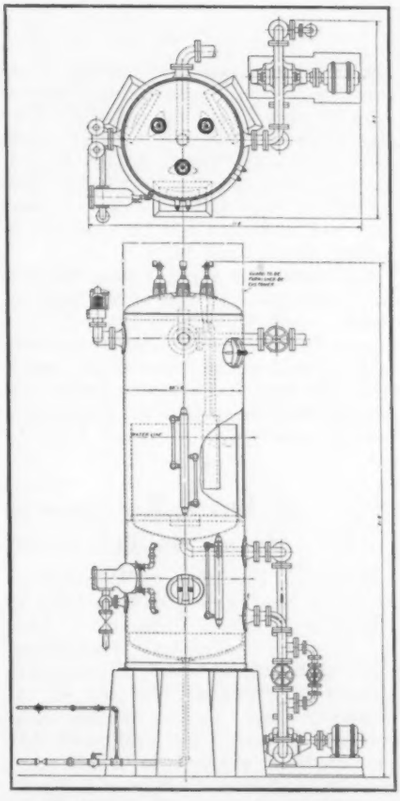
Electric Steam Generator Saves Operating Expense

At the Red River Lumber Co., Westwood, Calif., power is supplied through a hydro-electric generating system in conjunction with a steam power plant burning sawmill refuse. Exhaust steam from the latter is used in the dry kilns and, in times when lumber production is low, there is a shortage of hogged fuel so that the necessary amount of steam is not available for drying without resorting to burning oil. As the power requirements for the mill under low production conditions can be supplied by the company's hydro system and still leave an appreciable margin of excess capacity, an electric-steam generator was installed to utilize the excess hydro power.

The steam boiler, built by the Biglow Co., New Haven, Conn., is rated at 2,200 kw., three-phase, 60 cycle and is of the electrode type. It has an upper and lower chamber, the upper chamber being devoted to steam generation while the lower is used as a storage space or a self-contained hot-well. Three electrodes, rigidly supported to the roof extend down into the upper chamber. Current-carrying rods enter through specially designed insulator bushings.

External piping connects the upper and lower chamber, the water being circulated by a centrifugal pump from the lower to the upper in such a way that it washes upwards against the electrode surface and drains back into the lower chamber by gravity. A throttle valve in the discharge pipe of the pump regulates the flow and consequently the level of the water in the upper chamber, the level being dependent on the rate of flow compared to the rate of drainage into the lower chamber.

Normally, the electrodes are submerged in the water and a three-phase current, flowing between them through the water generates the steam. Variation of the water level will vary the resistance of the water, and hence provides a simple means of regulating the steam output either by hand or automatic methods. Steam is generated at 175-lb. pressure, the boiler having a quick pick-up because of conserving hot water in the lower chamber. Approximately 10 kw. is necessary to develop one boiler horsepower.



Outline diagram of the 2,200-kw., electrode-type, electric-steam boiler installed at the Red River Lumber Co.'s Westwood (Calif.) plant. This boiler uses excess hydro power to produce steam for the dry kilns when the hogged fuel supply is insufficient for plant requirements

Savings from the installation are conservatively estimated to be between $30 and $40 a day depending upon the amount of oil that otherwise would have to be used to make up the steam requirements of the plant when the hogged fuel supply was low. T. S. Walker, resident manager of the Red River Lumber Co., initiated the idea of this economy and is largely responsible for the installation which is one of the largest electric-steam generators in the country.

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Books . . .

You'll Need in Your Work

POWER SALES, by Dean Taylor. 206 pages. 5¼x8. $2. McGraw-Hill Book Co., Inc. For sale by McGraw-Hill Retail Room, 883 Mission St., San Francisco.

The author of this book is the power sales supervisor for the Utility Management Corp., New York. His book is essentially a handbook for the utility power salesman, including both the application of selling technique to the particular problems of load-building and the ways and means of meeting the competition of other forms of power. Problems are treated by well-presented practical selling methods and ideas. This book, the first devoted exclusively to selling power, should be a helpful guide to every employee of a utility commercial department.

▼

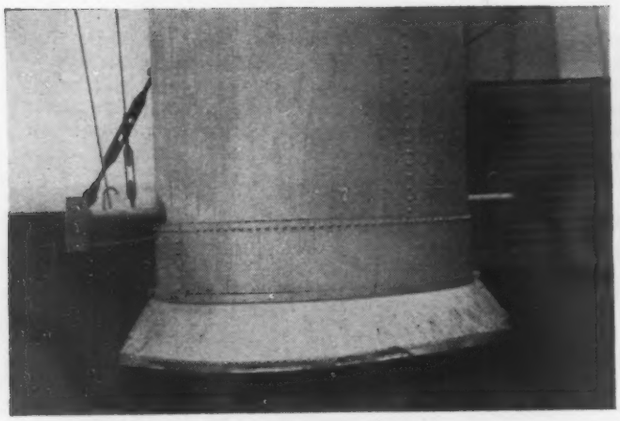
PROBLEMS IN PUBLIC UTILITY ECONOMICS AND MANAGEMENT. By C. O. Ruggles, Professor of Public Utility Management, Graduate School of Business Administration, Harvard University. 737 pages. 6x9. $6.

By applying the famous Harvard Business School case method to the analysis of problems dealing with the business and economic aspects of public utilities. Prof. Ruggles has produced an interesting and valuable work. The volume is divided into sections, such as economic characteristics of public utilities; production problems; management, organization and finance; wholesale marketing; retail marketing; valuation and rate making; and regulation, and the method of treatment follows the system of citing actual case problems and following them through to an answer. Thus there is developed a practical flavor to the book, based on the knowledge that the situations were real and the conclusions reached were not hypothetical or theoretical. One recognizes many famous cases and there are others that have been developed through the author's own field work. In all there are 120 problems that run the gamut of management. Utility executives and students of utilities will find the book a valuable reference volume.

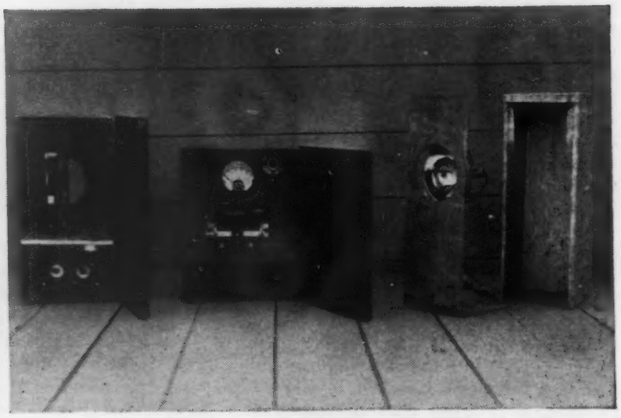
▼

HANDBOOK OF CHEMISTRY AND PHYSICS. Chas D. Hodgman, editor-in-chief. Eighteenth edition. 4½x6¾. 1,818 pages. $6. Chemical Rubber Publishing Co., Cleveland, Ohio.

This book represents a 20-year accumulation of data and information for the scientist and engineer that is essential in the commercial, educational and research laboratory.



Installation photograph of the smoke alarm at Station B. At the left end of the tube is mounted the light source which shines across the stack and into the photo electric cell housed in the black box



Component parts of the smoke alarm, (left) photo electric cell and amplifying tube; (center) indicating meter and relay; (right) housing for the light source which in this instance is an automobile spotlight

Photo Cell Provides Simple Smoke Control

All seven stacks of Station B, San Diego Consolidated Gas & Electric Co., are equipped with smoke alarms which have been in successful operation for more than two years. These devices are comparatively simple, consisting of a pipe at one end of which is a 21-cp. automobile spotlight bulb, welded into the stack so that the light shines diametrically across the stack into a similar pipe at the end of which is a photo electric cell. A current from the photo electric cell, varying in accordance with the amount of light it receives, is amplified by vacuum tubes to a magnitude sufficient to operate a simple relay. The relay in turn lights a signal lamp in the fireroom.

Adjustments are so made that the signal lamp is illuminated when the smoke becomes more dense than a light brown haze and thus informs the fireman that poor combustion conditions exist. As the device is in operation 24 hours a day, a continuous check on combustion conditions is provided, and the device serves two important ends, that of operating economy and smoke abatement.

▼

Appointed Lightolier Agents in the West

Incandescent Supply Co. has been appointed exclusive Western representatives and warehousers for the Lightolier Co., of 11 East 36th St., New York City, with territory including the eleven Western states. M. H. Jankelson, of Incandescent Supply, has just returned from a trip to New York City making the final arrangements.

Under this arrangement Incandescent Supply will act as exclusive factory representatives, selling the dealer trade, with warehouse stocks in Los Angeles and San Francisco, enabling products of the Lightolier Co. to be sold to the dealer at the same prices which Eastern dealers pay, plus actual freight. Displays will be maintained at both the San Francisco and Los Angeles offices of the company. The Lightolier line includes a complete lighting fixture line as well as floor and table lamps. Catalogs and literature will be available to dealers about April 15.

Mr. Jankelson reports that the factory looks for a revival of business because little building activity in the past five years has resulted in building shortages as well as the fact that old buildings will find it necessary under improved business conditions to renovate present quarters.

▼

Heintz & Kaufman to Work on Television

Heintz & Kaufman, radio manufacturers of San Francisco, have been licensed by Television Laboratories, Ltd., to construct television transmitting equipment under the Farnsworth patents for television by aid of cathode-ray tubes. License for the manufacture of receiving equipment has already been granted to an Eastern radio manufacturer. Heintz & Kaufman are the manufacturers of all the code-communication equipment used by Globe Wireless, Ltd., a subsidiary of the Dollar Steamship Co. They recently have been licensed to use the radio patents held by the Westinghouse Electric & Manufacturing Co.

Announcement has been made that Television Laboratories, Ltd., is planning a vigorous campaign for television service to all important centers of population in the United States before the end of 1934. Some broadcasting employing the Farnsworth patents is being done over wide channels in the neighborhood of 5 meters at the present time. Both pictures and the accompanying sound effects are transmitted on the same wave and reproduced from the same cabinet.

Home Modernization Standards Finished

Filling a need long expressed and now acutely felt, the Pacific Coast Electrical Bureau, just prior to its curtailed program, issued on one sheet a minimum residential standard for an electrical system in the modernizing of a home. It was largely the work of Frank J. Kiefer, northern region manager.

These standards call for a minimum of adequacy to provide convenience in the remodeling of old home wiring. A 1¼-in. conduit with three No. 4 and one No. 6 wires, or approved service cable of equivalent capacity, is required. Convenience outlets are specified wired in No. 12 wire with a maximum of eight outlets per circuit. A range circuit of three No. 6 wires terminating in either a box or a 50-amp., 125-volt receptacle is also required. Existing convenience outlets now connected to lighting circuits are allowed to remain thus connected.

The standards also make several recommendations for additional convenience by providing for air heating, water heating, switches, telephone service, ventilating fans, refrigerator service, radio, closet lighting, electric clocks and exterior decorative lighting. Copies may be had from the headquarters at 447 Sutter St., San Francisco.

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¶ **Illuminating Engineering** Society of southern California staged its annual fiesta or soiree Friday, Feb. 23 at the cafeteria in the Richfield Building, Los Angeles. The affair was entirely a social one and was well attended.

▼

¶ **"Bert" Hutchison** has opened in the electrical contracting and retailing business at 1519 West 8th Ave., Vancouver, B. C. One of the best known men in the wiring and retail trade at Vancouver, unitil its recent closure he was manager of the Universal Electric Company's store on Granville street.

Motor Forum

—An Idea Exchange

for the Industrial Man and his practical problems, either mechanical or of policy

How's About It?

"What's to be done about the junkmen who are selling motors at prices which the motor dealer cannot meet?" This complaint has been heard on every side lately. Well, either we might as well admit that we are no better qualified to sell motors than is the junkman and meet his competition in kind, or else take the position we have claimed as motor specialists, and really render a service which will justify our claim.

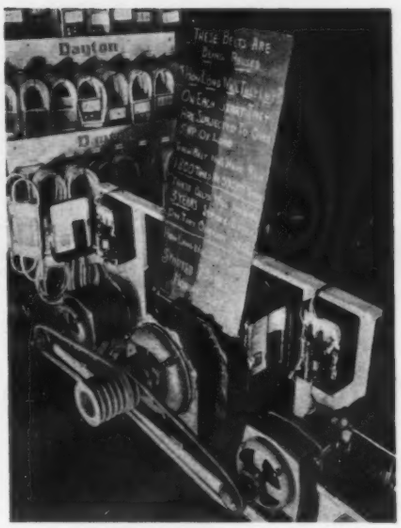
With indications of improving business, the motor dealer is going to have the opportunity of classifying himself in one of the other of the categories—junkman or motor specialist.

What motor dealer is there who during the last three years has sold any appreciable percentage of new motors? The demand has been and will for some time continue to be for "reconditioned" equipment. It is too bad there isn't some recognized standard by which to gauge reconditioning, and some insignia of certification which the honest motor specialist (and the term is used advisedly) could display, one that would set him apart from the unscrupulous who consider that a coat of paint will cover over a multitude of sins, or who think nothing of altering the name plate to call the equipment something it isn't or never was intended to be.

On the other hand, the coming era is going to be full of opportunity for the motor specialist (who is really that) to exercise his engineering ability to good purpose. Competitive power—gas engines—present a serious industry problem. Often times changes can be made in existing equipment by the motor specialist who knows his stuff, which will save the load for the utility company and develop nice business for the motor shop. And this is a class of business in which you will not be in competition with the junkman. Many typical cases could be cited where this has been accomplished—but, after all, this is not intended as a correspondence course on the subject.

Many fields for ingenious study are open to the motor specialist but he will have to pull himself out of the "rags, sacks and bottles" class. It's pretty much up to us as individuals as to how our businesses classify—whether under "Junkman" or "Motor Specialist." Up to now these have been almost synonomous in the ordinary acceptance of the terms. After all it's going to be very much like Andy's leopard skin, the polka dots will still be there.

—J. O. CASE
Quality Electric Co., Ltd., Los Angeles.



Life Test Advertises

A dramatic and novel test for V-Belts was operated in the window of the California Electric Works, San Diego, not long ago. Two 1½-hp. motors and a 5 -hp. motor acting as an idler were mounted on a board. Each was connected to the idler motor by means of a V-belt. Two magnetic switches operated alternately by a slow speed sign flasher caused each motor to run for 10 sec., stop and then after an interval of 4 sec. the other motor would run. Thus, a reversing action was set up which required a pull of between 25 to 30 amp. as a starting effort, whereas the actual running was on 3 or 4 amp. Each belt, therefore, had to withstand the friction imposed upon it by the inertia of the idler motor running in the opposite direction until it could be stopped and turned in the direction which that belt was moving.

Durability of V-belts for refrigerator operation was demonstrated in this way. The average refrigeration motor cuts in and out about sixteen times a day. This test cut in and out 1,800 times in 10 hours of operation per day or 180 times per hour. Belts such as this have never ordinarily been used on anything over ½ hp. so were ten times overloaded to begin with.

The demonstration ran for several days and attracted considerable attention among customers of this company.

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Prosperity Builder

Fred Edwards, genial proprietor of the Independent Electrical Co., San Diego, makes good use of a simple advertising card reminder. Daily he checks the newspaper columns for new arrivals, changes of residence, building permits, and sends those moving, building or arriving one of these cards. With a red pencil he checks off several of the items on the cards to give them especial emphasis. This gives them a personal touch which the card by itself would not have. Whenever called to replace fuses or shoot trouble the repairmen of the firm leave one of these cards at the meter as a reminder when the customer experiences trouble. The cards have been effective in bringing in a number of good jobs and many customers and friends.

▼

Kit and Bench

An unusually designed service tool kit is that shown in the accompanying illustration. It is employed by the North Bay Electric Works, San Rafael. Note how the tools are placed in compartments which slant toward the rear so that all tools are accessible even though placed in tiers. The tool box has ample room for two drawers which contain small fittings, bolts, etc. Note also the shop bench assembly, with a tesing panel, work light, small rack for rewinding small rotors, gas and air lines for torches.

Southern Inspectors Elect Riverside Man

Upland was the scene of the last meeting of the Sounthern California Chapter, International Assn. of Electrical Inspectors, late in January. James M. Evans, Board of Fire Underwriters of the Pacific, acted as chairman, in the absence of Fred H. Vore, city electrician, Pasadena. Frank A. Short, electrical engineer, California State Industrial Accident Commission, reported on the pending revision of the State Electrical Safety Orders and announced that the orders would soon be published and copies avaiable. Orders will become effective on the date of issue.

Herbert G. Ufer, Western superintendent, Underwriters' Laboratories, Inc., Harry N. Beecher, chief electrical inspector, city of Los Angeles, and others led a discussion of various inspection and related problems.

Officers were selected for 1934 as follows: Ora M. Shigley, city electrician, Riverside, chairman; Theodore C. Combs, building inspector, Upland, re-elected secretary-treasurer. Victor M. Hartley, Pacific Coast Electrical Bureau, warned of street lighting rackets. The next meeting is to be held March 21 in Riverside.

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EVERYTHING FOR TRANSMISSION AND DISTRIBUTION LINES

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KEARNEY TRIPOMATIC PORCELAIN HOUSED CUTOUT

Outage indicating — air gap separation of contacts—cartridge and door are a single unit—swivel hanger —point pressure contacts.

Further Information Gladly Furnished

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LAPP Fog Type Insulators

Cleaning insulators even as seldom as once a year can no longer be justified.

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LOCUST PINS

. . . . . Oak Brackets *and* Pole Steps

Safety — Strength and Lasting Economy

LOCUST PIN CO., - - Front Royal, Va.

MAYDWELL & HARTZELL INCORPORATED

FACTORY DISTRIBUTORS

LOS ANGELES SAN FRANCISCO

Transformer Re-Winding Helps Distributor

One of the two exclusively radio parts distributors now operating in Portland, Ore., is the Northwest Radio Supply Co. This is a reorganization of the old Northwest Radio Co., taken over by two employees of the former concern. T. B. Morgan is the president and Edward Stocklen, vice president.

Since taking over the company, these two young men have succeeded in keeping it out of the red, and have shown a gain of about 40 per cent in the gross. This they modestly attribute to bettering conditions. Nevertheless some strenuous work and hard thinking were necessary to accomplish the result.

For one thing, it became necessary to get along without traveling salesmen. One man only could be retained for the road—whose capacity is that of a contact man who must cover all their dealers in a large territory representing most of the state of Oregon.

This reduced the overhead, but what was to be done to keep business coming in by mail until salesmen could again be employed? They hit upon the idea of a transformer re-winding department. This is probably the only one in the Pacific Northwest. A man is kept busy constantly rewinding transformers for dealers who send them in by post. The work is done with exactness, and the transformer turned out just it was when new, so that it will fit back into the set.

This department has been growing in importance rapidly. It makes the best kind of a dealer contact, and one with which a direct advertising campaign can be tied in.

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North Coast of Portland Expands

V. M. Miller, vice-president of the North Coast Electric Co., electrical distributors with headquarters in Seattle, was transferred about six months ago and made manager of the Portland office. Since that time, additions have been made to the organization, and a general shifting around has taken place with the result that there has been a considerable increase in volume from this branch.

Fred Zaugg, formerly Electric Corporation lighting specialist in Portland was hired, also L.D. (Long Distance) Hewitt, radio specialist. Donn Flynn was brought in from Eugene, Ore., to be full time salesman in Portland.

Then Frank Paulson was made sales manager and D. J. Morris office manager. Art. Stevenson and Lawrence Stohler remain on the sales force and several office employees were added.

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¶George E. McDonald, manager of Jameson Electrical Company, Victoria, has been elected president of the Victoria Credit Grantors' Association. Mr. McDonald is well known in the electrical industry on the Pacific Coast.

Fight Layoffs of Portland Inspectors

Representing the electrical industry of Portland, a large delegation from all branches prepared a masterful brief petitioning the mayor and the commissioners of that city to reconsider the decision to reduce the personnel of the electrical inspection department of Portland. The petition pointed out that the department was already operating on a curtailed basis and would be returned to a 1916 operating basis by the move. Its excellent work in seeing that only safe electrical appliances were offered to the public of Portland would have to be abandoned as well as building construction delayed by the added burden thus placed on the remaining inspectors. Reinspection will also have to be abandoned and the following up of camplaints as to dangerous wiring will be practically inhibited. It was also pointed out that the department could not give proper attention to radio interference complaints nor inspect electric signs, elevators or appliances as required by city ordinances.

Income from the department was shown practically to carry it, with a deficit of not more than $18.50 per month. It was suggested that slightly higher fees should take care of this deficit also.

A meeting was held with the city commissioners also. To date no action rescinding the curtailing of the department had been taken.

▼

¶ **Charles Huyck,** Graybar Electric Co., San Francisco, was the feature speaker at the Feb. 1 meeting of the Santa Clara County Electrical Development League. He spoke on "The Business Value of a Few Electrical Believe-It or-Nots."

▼

¶ **Uphold Contractors Licensing** — Los Angeles Superior Court handed down a ruling upholding the constitutionality of the California State Contractors' Act, reversing a decision previously made by Municipal Judge Joseph A. Call. The Contractors License Bureau announces that the registration of contractors throughout California for the year 1934 continues at a high level. The number of complaint cases filed with the registrar have also increased slightly. The bureau's budget has been reduced and a 50 per cent reduction in the annual license fee is in effect this year. According to registrar of contractors, Carlos W. Huntington, adoption of NRA codes for the construction industry materially strengthens the ability of this bureau to assist the construction industry in policing illegal and unethical practices and urges that his department be called upon for assistance in such cases.

▼

¶ **Davis, Calif.,** has recently adopted the Standard Electrical Ordinance proposed by the Pacific Coast Electrical Bureau.

Save Fuses In Testing

"Many a fuse has been blown needlessly in testing out a circuit for a short or ground, when a circuit tester is not at hand. While there is nothing startlingly original about the following method, it is an idea that possibly not all have been in the habit of using." This from G. C. Sanders of the J. R. Tomlinson Electric Co., Portland.

'Take out all the lamps from the suspected circuit and open the switches of the sockets. In place of the circuit fuse plug, insert a lamp. In case of a short it will burn. Then begin and put lamps back in the sockets one by one and close their switches. In case of lamp No. 1, if it lights, circuit is all right to that point. If not, this shows that the short is ahead of that lamp. By proceeding in that way the trouble can be located quite easily and cleared up before placing the circuit fuse back in its socket."

▼

¶ **Thomas & Betts Co.** has announced new representation in California. E. L. Johnson, formerly with the H. B. Squires Co., is San Francisco factory representative, located at 542 Natoma St. E. J. Frentess, 3520 Live Oak St., Huntington Park, Calif., is southern California representative.

WHERE TO BUY . . . IN THE WEST

PACIFIC Guy Strand

Made from

Copper Bearing Steel

No known failures in nine years

PACIFIC WIRE ROPE CO., LOS ANGELES

"CRUCIBLE *Copperbond*"

GROUND RODS

Made by the "Controlled Molten Welding Process"

Easy Driving — Long Life — Copper Welded to Steel

NON-RUSTING

Fabricated in California by the Kortick Mfg. Co. from Genuine "Crucible Copperbond" Hot Rolled Rods, produced by Crucible Steel Co. of America. Distributed on the Pacific Coast by

MAYDWELL & HARTZELL, Inc.

Underground Transmission

Without Conduit

Note the air and moisture proof flexible coverings. Sealtite represents a distinct advance in parkway cable construction. It is more pliable than any other underground cable . . . and costs are considerably lower.

Write for booklet offering suggested uses and explaining long life.

SEALTITE

Parkway and Airport Cable with Maximum Flexibility by

PROVIDENCE

McLAUGHLIN

For Telephone *and* Telegraph Lines.

GLASS INSULATORS

MAYDWELL & HARTZELL

INCORPORATED

FACTORY DISTRIBUTORS

LOS ANGELES SAN FRANCISCO

Practical Men » » »

Alameda County Contractors Organize

Using an informal association, which during the past five years has had but eight or ten numbers, as a nucleus for an enlarged county organization, the Electrical Contractors Assn. of Alameda County last month decided upon a new program of expansion to fit it to operate under the NRA code. Frank E. Boyd, Pacific Electric Motor Co., Oakland, is president and George Eldridge, former field secretary for California Electragists, has been retained as executive secretary for the association.

Officers elected at the annual meeting, in addition to Mr. Boyd, were; William Bernhardt, Bradshaw Electric Co., Berkeley, vice-president; Dan Bronson, California Electric Co., Ltd., Oakland, secretary, and T. L. Rosenberg, T. L. Rosenberg Co., Oakland, treasurer. Offices have been taken in the Builders Exchange at Webster and Hobart Sts. for association headquarters.

A membership drive is under way under a committee headed by E. L. Buttner, Scott-Buttner Electric Co., Oakland; A. R. Matson, Matson-Seabrook Electric Co., Oakland, and Howard Neighbor, Neighbor Electric, Berkeley. A public relations and publicity committee, consisting of Walter Vance, Pacific Electric Motor Co., and T. L. Rosenberg, was also named. It is planned to enlarge the membership and carry on several classifications of work for residential, industrial and commercial wiring groups. Meetings are to be held both in Berkeley and in Oakland, those in Berkeley meeting once a week and in Oakland another day the same week, the executive secretary acting as contact between the two groups.

▼

¶**C. Dent Slaughter,** well known as representative of Anaconda Copper Co. on the Pacific Coast for many years, writes that his present position is that of special representative, with headquarters in the New York office at 25 Broadway. He will be traveling the eastern and middle western territories in the furtherance of sales and special commodities, contacting jobbers, architects, engineers and governmental departments.

▼

¶**Clyde L. Seavy** was re-appointed chairman of the California State Railroad Commission by the members of that commission last month. Mr. Seavy has twice before served as chairman of the commission.

▼

¶**"Mullenbach Greetings"** is a little mimeographed announcement published each month by Joe Mullenbach, manufacturer of switchboard and panelboard equipment in Los Angeles.

Officers of the Alameda County (Calif.) contractors' organization. Standing from left to right are George Eldridge, Dan Bronson and T. L. Rosenberg. Seated are William Bernhardt and Frank Boyd, president of the new group

¶**H. J. Billica,** formerly of Graybar Electric Co., Inc., and more recently with Allied Industries, has been appointed Pacific Coast sales representative of Porcelain Products, Inc., of Parkersburg, W. Va. Mr. Billica has established officers in the Rialo Bldg. in San Francisco.

▼

¶**R. A. Balzari,** for the past several years a member of the McGraw-Hill Publishing Co., Inc., marketing counsellor's staff, has taken a year's leave of absence, during which he will direct Pacific Coast operations of the Sales Analysis Institute, which furnishes a consulting sales training service. For the present he will have his headquarters with the Texaco Co., working with that organization's sales force. Prior to going with McGraw-Hill, Mr. Balzari was manager of the industrial department of the San Francisco district of the Westinghouse Electric & Mfg. Co. He is also a past president of the San Francisco Electrical Development League.

▼

¶**Joe Smith,** sales manager of Hubbard & Co. with headquarters in Pittsburgh, Pa., visited the Pacific Coast during February. Much of his time was spent conferring with W. W. Glosser, Pacific Coast manager of the company at its Emeryville factory.

▼

Tom Wood, Seattle manufacturers' representative is not only well known in his business lines but as a golfer he has a reputation often challenged but still unmatched.

¶**Committees** of the Illuminating Engineering Society, San Francisco Bay Cities Chapter, were announced by Harold L. Gerber, chairman, and Leo Gianini, vice-chairman, recently. The chairman of the various committees are as follows: Papers and programs, Leo Gianini; membership, Wm. S. Hanbridge; attendance, Roy D. Myers, who is also secretary-treasurer; educational, Leland H. Brown; industrial lighting, W. W. Hanscom; show window lighting, Roy D. Myers; floodlighting, Carl O. Martin; school lighting, G. M. Simonson; hospital lighting, Leonard A. Hobbs; street and highway lighting, Wm. P. Bear; office lighting, R. A. Hudson; store lighting, Wm. S. Hanbridge; theatrical and decorative lighting, G. M. Simonson; home lighting, Clark Baker; auto and aviation, Llewellyn Boelter; Mazda lamps, Leo Gianini and research, Leland H. Brown.

▼

¶**Ray A. Edwards,** safety engineer for the San Diego Consolidated Gas & Electric Co., has been selected by the National Safety Council as news letter editor in the Public Utilities Section. Mr. Edwards himself edits the mimeographed pamphlet which is issued monthly to all members among the public utilities. Contributor to various electrical and gas publications, writer for the San Diego Consolidated Gas & Electric Co.'s "News Meter," participant in speaking contests for the company, Mr. Edwards now enlarges his field and produces a newsy and informative publication. He has the happy faculty of being able to give a touch of humor to a subject which is so often dealt with only in tiresome earnestness.

▼

¶**Fred D. Weber,** president of the Oregon State Board of Engineering Examiners, in a public statement recently, pointed out the values to the public of the examination of engineers in the state of Oregon. He showed how it safeguards the public from bogus engineers. Mr. Weber has been on the board under four governors and is now its president.

▼

¶**Oliver B. Lyman** announces that R. E. Murphy has recently been appointed sales manager of the I-T-E Circuit Breaker Co., whose general offices are in Philadelphia. Mr. Murphy was for ten years sales manager of Esterline-Angus Co., of Indianapolis. The I-T-E company has offices in Los Angeles with Otto Demmert in charge and the Seattle office is in charge of Burton Stare.

▼

¶**Gilbert-Weston-Stearns, Inc.,** of Santa Ana, who for many years have confined their efforts to the construction field, have opened a new store next to the Southern California Edison Co.'s office in Santa Ana. Here the company carries a complete line of merchandising items and are tying in with the power company's new merchandising program.

¶Fred D. Weber, of Portland, has been appointed chairman of the Electrical Workers' Sub Commission of the Oregon Building Congress Apprenticeship Commission, succeeding F. H. Murphy who resigned. Mr. Weber is electrical engineer for the Oregon Insurance Rating Bureau and president of the Electric Club of Portland also.

▼

¶William P. Selfridge, of Fullerton, Calif., who for many years has done only wiring, has opened a new store on Wilshire Ave. with a complete line of merchandise in order to capitalize upon the Southern California Edison Co.'s cooperative merchandising activity in that region.

▼

¶Scott-Buttner Electric Co., of Oakland, Calif., for many years located on Grand Ave. near the old Key Route Inn, recently moved to an enlarged store at 23rd and Webster Sts., Oakland, where merchandise is displayed to better advantage.

▼

¶H. H. Van Luven has announced the formation of a new sales organization to handle the lines of the S. H. Couch Co., Inc., and the Cannon Electrical Development Co. products in the three Western states, California, Arizona and Nevada. Mr. Van Luven was formerly president of Sierra Equipment Corp., and located in Los Angeles. Mr. Van Luven's company is now located at 1127 Wall St., Los Angeles. Associated with him are George P. Kafoury, William Brunick and John G. Ashton, Jr. Warehouses and sales offices will be maintained in San Francisco and Los Angeles.

▼

Trumbull Electric Mfg. Co. has announced that the San Francisco,, Seattle and Los Angeles divisions of the Trumbull Electric Mfg. Co. will handle the sales of all Trumbull products including those made at its Plainville factory, effective the first of this year.

▼

¶Jack Baxter, S & M Lamp Co. representative in the Northwest, recently spent a week in Los Angeles discussing sales plans with Jim Sbirreffs, president and manager of the reflector manufacturing company.

▼

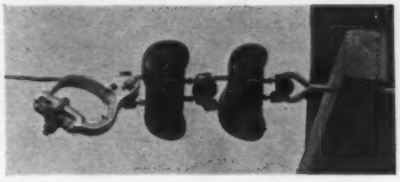
¶"Autocall and Howe" seems like a slang expression but in reality it's the announcement of the merger of two of the best known national concerns making fire alarm and signaling apparatus. J. Dannheiser, San Francisco manager, The Autocall Co., announces this merger and points out that now will be made available in the West some of the exclusive features of the Howe Co. which provide great saving in circuiting and a number of extra automatic features.

▼

¶Wuelker Reflector Lighting Co. has announced the consolidation of their showroom to the office of their factory at 195 Fremont St., San Francisco.

New Devices » » »

to Use on that Next Job



O-B Strain Fittings

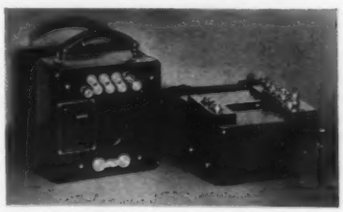
Ohio Brass Co., Mansfield, Ohio, has designed a new line of strain fittings so as to develop the full strength of porcelain strain insulators. The fittings are made in two sizes which will accommodate all the various sizes and makes of standard strain insulators. They consist of a yoke and a length of stranded cable, each end of which is flash-welded to a machined ball-terminal similar to the ball-socket attachment of suspension insulators. The accompanying photograph shows the fittings in use.—Electrical West, March, 1934.

▼

Recloser

General Electric Co. has developed an inexpensive, direct-acting reclosing device designated as type SM for use with oil circuit breakers. This attachment will reclose a breaker one, two or three consecutive times with equal time intervals between reclosures when the breaker is tripped by overload. If the overload disappears after any reclosure, the attachment will return to its normal positions and the breaker will remain closed. If the overload still exists after the last reclosure, the breaker will remain locked open and it will be necessary to close it manually before any further automatic operation takes place. The attachment is a mecury-tube device in which timing is obtained by running mercury through an orifice into a reclosing contact chamber. Number of consecutive reclosures and time interval between reclosures is fixed during manufacture of the tube. However, the device is arranged so that a new tube may be readily substituted if different numbers of reclosures or different time interval are desired. — Electrical West, March,, 1934.

▼



Portable Current Transformer

The Esterline-Angus Co., Indianapolis, Ind., has designed a new portable current transformer for use with indicating and recording instruments. Each transformer has nine primary current ranges of 10, 12½, 25, 50, 100, 160, 200, 400 and 800-amp. capacity. The secondary capacity is 5 amp., adapting the transformer to use with all standard a.c. ammeters, wattmeters and power factor instruments. They are insulated for use on circuits of all voltages up to and including 2,500 volts. The containing cases are cast aluminum to withstand rough usage. Weight is 28 lb.—Electrical West, March, 1934.

▼

New Capacitor Line

The Ideal Electric & Mfg. Co., Mansfield, Ohio, has developed a complete line of capacitors, or static condensers, for power factor correction. A unit type of construction is employed consisting of an assembly of small independent hermetically sealed can units. Box-type capacitors are furnished in welded sheet steel cases supplied with weatherproof covers and are suitable for either indoor or outdoor service. Rack-type capacitors are generally employed in sizes over 30 kva. and are supplied in weatherproof housing or with heavy steel screen enclosures for industrial use. Capacitors are available in all voltages up to 4,600 for any frequency and phase arrangement and in any size desired.—Electrical West, March, 1934.

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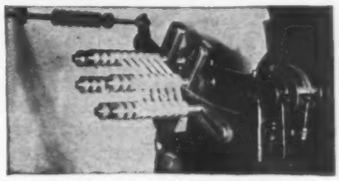

Universal Coil Winder

Ideal Commutator Dresser Co., Sycamore, Ill., has placed on the market a new inexpensive coil winder of the universal type for making coils such as motor, armature, field or transformer. It consists of a cast steel base with two slides and six adjustable spindles which permit making diamond, round, square or rectangular coils. Diamond coils may be made in series of any number up to eight. The base plate is designed to fit any lathe head.—Electrical West, March, 1934.

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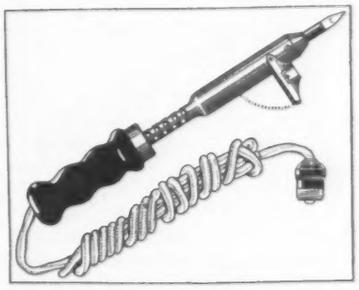

New Soldering Irons

Warner Electric Products Co., San Francisco, announces a new line of electric soldering tools which incorporate many new features including a self-contained, non-heating collapsible stand which is a part of the iron itself. The irons are made in various capacities ranging from 40 to 650 watts.—Electrical West, March, 1934.

▼

Welding Timer

The Electric Controller & Mfg. Co., Cleveland, Ohio, announce a new automatic weld timer. The new device does not provide a definite amount of time for each weld but varies the time automatically in inverse proportion to the rate of current flow to produce a 100 per cent weld at each operation. The timer consists of a rectifier tube which charges a fixed condenser in proportion to the rate of current flowing in the welding circuit. When the charge reaches an amount sufficient to pass current through two neon gas-filled tubes, a small relay is operated which in turn opens the relay controlling the main line contactor. The tubes are in the circuit only when the welding current is on so that as soon as the main welding circuit is opened the weld timer is ready for the next operation.—Electrical West, March,, 1934.

What's New?

P. C. E. A. to Resume Limited Functions

Plans for reviving activities of the Pacific Coast Electrical Association and absorbing part of the program of the Pacific Coast Electrical Bureau, which has been abandoned, were discussed at a meeting of the P. C. E. A. executive committee held in Los Angeles February 20.

Agreement was reached that a strong all-industry trade association is essential for the welfare of the industry and a committee headed by A. W. Markwart, vice-president, Pacific Gas and Electric Co., was appointed to work out details of organization and to suggest a plan of operation.

Under the program suggested the association would have two divisions, a Business Development Section and an Operating and Economics Section, each of which would hold two conclaves a year, one in the north and one in the south.

▼

Pepco Seeks Way Out of Financial Tangle

Because of the necessity of conserving the earnings of Portland General Electric Co., Portland, to meet some $14,000,000 of its bonded indebtedness maturing in 1935, Portland Electric Power Co., the parent organization, is unable to meet full interest charges due March 1 this year on approximately $16,000,000 of its 6 per cent debentures of 1950 and the board of directors has proposed a plan whereby these debenture holders may protect their interests through an exchange for 6 per cent collateral trust income bonds.

The debentures, whose holders are asked to substitute their holdings for an equal amount of the new income bonds, are an obligation of Portland Electric Power Co., though they carry the name of Pacific Northwest Public Service Co., this name having been changed subsequent to their issue. They are not collateralized and do not constitute a lien on any specific property. They are outstanding in the amount of $15,970,000 and constitute the whole of the funded debt of this company. The collateral trust income bonds offered in exchange are to carry the same interest rate and the same maturity date, March 1, 1950, but are to be secured by the entire capital stock of Portland General Electric Co. and of Portland Traction Co. Interest on them is to be payable semi-annually only out of available income, is to be cumulative from September 1, 1933, and no dividends are to be paid on the stocks of Portland Electric Power Co. until all current and accumulated interest on the new bonds has been paid and a sinking fund of 50 per cent of any remaining net earnings has been set up for retirement of the issue.

If and when the accumulated and unpaid interest on the new bonds shall equal 30 per cent of the principal amount, the trustee may declare the entire principal and accumulated interest then outstanding due and payable. The new collateral trust agreement will contain a covenant by the company to pay at least 3 per cent interest on the new bonds during the present calendar year.

Conditions bringing about the necessity for some plan to furnish a breathing spell for the company to work out its financial problems are given in a statement by Franklin T. Griffith, president, accompanying the offer to debenture holders. Portland Electric Power Co's principal sources of revenues are dividends on its wholly owned common stock of Portland General Electric Co. and its wholly owned common stock of Portland Traction Co. and on its earnings from the operation of a small interurban railway. Declining earnings in all these operations and increasing taxes, coupled with the necessity for conserving the resources of Portland General Electric Co. to meet bond maturities next year, have combined to make the situation somewhat critical. Both the interurban railway and traction company showed a deficit after operating expenses, taxes and depreciation, and Portland General Electric's net has declined to a point where it cannot sustain its former dividend rate on its common stock. Portland General Electric has no preferred stock and Portland Traction Co. has no preferred stock nor funded debt.

Mr. Griffith's letter points to mounting taxes, which now amount to approximately 19 per cent of gross revenues and a total amount greater than the company's payroll. He also makes a plea for fairness in the prospective competition the company may face with the federal government from the Bonneville development, and in this connection he states that the taxes paid by Portland General Electric Co. now amount to more than the sum computed by federal engineers to cover annual interest on the cost of and the annual operating expense of this development.

▼

¶**Employees Share**—Market St. Railway Co., operating in San Francisco, recently announced a new plan accepted by the employees whereby a 60-40 division of any possible profit from the operation of the railroad each year is to be made between stockholders and employees. This plan was adopted after lengthy conferences on wage scales in which it was shown by the company that by maintaining a 5-cent fare only such a profit sharing plan was favorable to management and employees. A vote of employees was taken and a large majority vote in favor of the plan put it in effect.

P. G. & E. Gives Farms Temporary Reduction

On account of surplus power brought about by favorable water conditions, Pacific Gas and Electric Co. is making a contribution to the farm consumers on its lines in the form of a temporary rate reduction. The plan, approval of which is being sought from the Railroad Commission, contemplates furnishing at half price during April, May and June all electricity used by agricultural power consumers in excess of the kilowatt-hours consumed during the same months last year.

Commenting upon this concession, which is brought about by the heavy excess runoff, P. M. Downing, vice-president and general manager of the company, states, "We are simply passing along to our consumers some of the benefits of this extra power production."

This temporary reduction in agricultural power rates follows a reduction announced a month ago whereby all domestic consumers who install both a standard electric range and electric water heater with a double-throw switch or a load limitator will receive all energy in excess of 170 kw.-hr. per month at the rate of 1 cent per kw.-hr. This latter rate has appreciably stimulated water heater sales in the territory served by the company.

▼

Court Rules Against Utility Budget Cuts

Temporary restraining order has been issued by the federal court in Portland, Oregon, against the order of Charles M. Thomas, public utilities commissioner of the state, reducing salaries and disallowing management fees and certain donations proposed in the budgets of Northwestern Electric Co., Pacific Power & Light Co. and Portland Gas & Coke Co.

By stipulation it has been ruled that hearing on the petition for temporary injunction will be held before a three-judge court. The commissioner's order protested by these three companies was issued early in January along with a number of similar orders affecting other companies operating in the state, striking out of operating budgets of these companies various items of proposed expense. The commissioner stated that he had no objection to the payment of these items out of surplus belonging to the stockholders but he disallowed them in so far as they affected the rate of return of the companies for rate-making calculations.

▼

¶**Operating budget** of the Los Angeles Gas and Electric Corp. for 1934 calls for total expenditures of $13,105,000 exclusive of bond interest and dividends. Expenditures for gas and electric plant construction covering materials, equipment and construction payroll, together with the major plant operating costs, amount to $5,855,000. The tax figure for the year 1934 is estimated at $2,850,000.

Oregon Grange Bill to Go on Ballot

The Grange power bill, in litigation since its passage by the regular session of the Oregon legislature in 1933, will go on the ballot of the 1934 general election in November under a referendum sponsored by the Security Owners Association of that state, according to a court ruling announced February 22.

The bill, which provides for a power commission with authority to build plants and lines for the sale of electric power and to issue bonds for this purpose, was passed by the 1933 legislature in compliance with what the legislature understood to be a mandate of the people expressed in a constitutional amendment passed by the people opening the way for such action by the state. Referendum proceedings were immediately commenced by the Security Owners Association and, on being filed with sufficient signatures, were contested by the Grange on the ground that the referendum was illegal. Thus the operation of the act was held up, and the recent decision opens the way for the determination of the issue by a vote of the people next November.

▼

Commercial Conclave Held in Seattle

The ninth annual conference of the Business Development Section of the Northwest Electric Light & Power Association will be held in Seattle March 8 and 9, 1934. The Business Development Section corresponds to the former Commercial and later Sales Section of the association. Headquarters will be at the Washington Athletic Club.

The conference will be modeled after those held in recent years in which committees studying all classes of utility load development and the distribution of electrical appliances through all outlets will report. Emphasis will be laid this year on successful selling and promotional efforts. The business development possibilities in the industrial, commercial, domestic and rural fields will be fully discussed.

The meeting will be conducted by R. B. McElroy, The Washington Water Power Co., chairman, with R. M. Bleak, Utah Power & Light Co., vice-chairman; L. T. Merwin, vice-president and general manager, Northwestern Electric Co., will open the sessions as president of the association, and will be responded to by J. F. McLaughlin, president, Puget Sound Power & Light Co., Seattle.

The following subjects will be covered by bureau and committee reports: Advertising, A. C. McMicken, Portland General Electric Co.; customer service, R. M. Bleak; dealer relations, Lewis A. Lewis, The Washington Water Power Co.; industrial and commercial sales, H. C. McDaniel, Pacific Power & Light Co., with committee reports on commercial cooking, air conditioning, commercial and industrial lighting and industrial power; residential sales, Guy E. Davis, Pacific Power & Light Co., with committee reports on cooking, water heating, home appliances and home lighting; and rural sales, L. C. Moore, Portland General Electric Co. Reports are to be presented in outline form leaving time for full discussion to bring out all the business building possibilities contained in them.

Progress and plans of the National Refrigeration Bureau and National Electric Cookery Council will be told by G. M. Gadsby, Utah Power & Light Co., and K. M. Robinson, Idaho Power Co., who are Northwest directors of these two organizations, respectively. Speakers from outside the association territory will be present to discuss topics pertinent to the purpose of the meeting.

▼

P. G. & E. Rate Order Enjoined by Court

By virtue of an interlocutory order restraining the California Railroad Commission from enforcing a recent $2,100,000 reduction in natural gas rates handed down by the federal court hearings on the Pacific Gas and Electric Co.'s appeal from the order will begin March 19 before H. M. Wright, special master in chancery, appointed by the court. In ruling on the injunction the federal court expressed "grave doubt" of evidence presented before the railroad commission.

"The commission rejected the reproduction cost estimate of the Pacific Gas and Electric Co.," the court stated, "did not have any detailed estimates of reproduction costs before it, and did not determine such cost of the plaintiff's property." The Supreme Court in several instances held this to be essential. As the commission has departed from the rules laid down by the Supreme Court, a hearing is inescapable.

"While we refrain from expressing an opinion at this time as to the proper rate of return, it is clearly doubtful whether 6⅔ per cent (the rate fixed by the commission) is sufficient to produce a fair return on the fair value of the property."

▼

¶**Contract** for furnishing the electric motor equipment for dredging service in connection with the projected Fort Peck Dam across the Missouri River in eastern Montana has been awarded to the General Electric Co. This equipment, which will cost approximately $750,000, will include twenty-one 2,500-hp. main pump motors, five 700-hp. cutter motors and five 150-hp. winch motors, all of the wound-rotor type, as well as the necessary control apparatus.

▼

¶**Gross earnings** of Pacific Power & Light Co. were $348,861 less during 1933 than in 1932, a decrease of 9 per cent. Balance available for preferred stock dividends was $77,104, as compared with annual preferred stock dividend requirements of $458,469. No dividends were declared on the preferred stocks.

Supreme Court Upholds Seattle Utility Tax

The U. S. Supreme Court has upheld the city of Seattle's license or occupation tax against attack of the Pacific Telephone & Telegraph Co., in an opinion by Justice Stone. The court held that the decision of the state courts against the company must be affirmed because appellant's objections are "more fanciful than real," and "that in practical application under present day systems of accounting, appellant will have no serious difficulty in ascertaining the amount of the tax it is required to pay and because the complaint did not show any administrative action had been taken."

The court held the ordinance does "not purport to define the duty of the taxpayers," leaving that to an administrative office, in which "we see no invasion of constitutional immunity" as claimed.

Two suits similar to the telephone company's complaint are still pending before the high court — that of the Puget Sound Power & Light Co. and the Seattle Gas Co., which appealed to the high tribunal after losing decisions in the state courts. Arguments in the other suits were heard by the federal supreme court a month ago. The ordinance now in litigation fixes an occupation tax of 4 per cent of the gross annual receipts upon the telephone com- and the city water department and 3 per cent on the power company, city light and the gas company.

If the city wins the final decision in all three cases, it will collect from the companies $754,304 due as occupation tax for the last half of the year 1932, and all of the year 1933.

▼

Northwest Engineers To Meet in May

The Engineering and Operation Section of the Northwest Electric Light & Power Association will hold its 1934 annual meeting in Portland, Oregon, in May, with the definite dates to be set later. This was determined at a meeting of the section executive committee in Portland February 9.

The meeting this year is to be somewhat less formal than former ones. There are to be fewer prepared papers and more informal discussion of current operating problems. Emphasis will be particularly on ways of reducing operating expenses or raising revenues.

A new committee on utilization will be given prominence in this year's meeting. This committee is studying the engineering aspects of new or old applications with particular reference to possibilities of increasing industrial power load.

▼

¶**R. R. Drake** has been appointed tax agent of The Southern Sierras Power Co. and associated companies with headquarters at Riverside. Mr. Drake joined the company in 1920 as collector and solicitor of new business.

Utah Power & Light Revenues Decline

Operating revenues of the Utah Power & Light Co. and its subsidiaries for 1933 amounted to $9,529,338, compared with $10,447,840 in 1932, according to the annual report. Net revenues from operation declined $703,629. The tax bill of the company for the year was $1,482,344, which is equal to more than 40 per cent of the total operating expenses and equivalent to $6 on each share of preferred stock.

An operating budget of $5,600,000 for new construction, operation, maintenance, taxes and payrolls was announced by the company for 1934. Approximately $300,000 of this sum will be spent on new construction, including extension and reinforcement of existing service facilities and replacements at the Grace and Granite hydro-electric plants.

▼

Oregon Utility Investors Organize

Protection of the interests of 40,000 investors in Oregon public utilities is the avowed purpose of an organization formed recently known as the Utility Security Holders' Protective Association. The president is Harry T. Capell, a Portland building contractor. It is said to have had its inception in a meeting of a small group of investors in the home of Mrs. George I. Thompson.

A total of 10,500 questionnaires were sent to utility security holders requesting their support and some 3,500 were returned.

The organization favors the privately owned utility and will be developed into a state-wide association. The association will be non-political and will not endorse candidates. The statement is made, however, that it will oppose anyone trying to ride into office on a platform predicated on the destruction of local utility investments.

▼

Oppose Johnson Bill in Senate

Opposition to the bill introduced in the United States Senate by Senator Johnson, of California, to enjoin public utilities from using the federal courts as injunction weapons to fight state regulatory commission orders was offered by various organizations at committee hearings on the bill in Washington.

The proposed law, its opponents argued, violates the due process guarantee of the Constitution as well as that forbidding any state to enforce a law which abridges the privileges of citizens or denies them equal protection of the laws. It also was contended that the measure discriminates against one particular group of citizens.

If it is possible to tell the citizens who own stock in the public utility companies, it was contended, that they may not appear before federal courts, there is no reason why the restrictions should not be carried further and made applicable to banks, to milk producers, agricultural co-operatives, or to groups of citizens engaged in any other activity.

Public utility companies were described as trustees for the savings of millions of people. Savings of 39,267,000 citizens, as represented in savings institutions, are invested in the obligations of public utility concerns. In one utility company alone, it was pointed out, there are 2,000,000 stockholders. The average holding is $3,000, par value. By placing utility companies in a position where they would be more greatly exposed to attack from those with selfish interests, it was contended that the welfare of the 121,761,000 life insurance policy owners is involved.

▼

Los Angeles Wins Mono Basin Rights

The right of the city of Los Angeles, Calif., to divert water from the Mono Basin to the Owens River aqueduct has been sustained in a ruling of the superior court of Tuolumne county. The ruling was made following a lengthy trial of issues in a condemnation suit brought by the city against 130 landowners in the basin. The case was tried in Tuolumne county to avoid any possible charge of prejudice.

The purpose of the action was twofold: to serve legal notice that the city is in the process of acquiring the water rights involved and to show the necessity of the city acquiring the water rights. Included among the defendants was the Southern Sierras Power Co. as a legal necessity, the city already having entered into a contract with the company for the purchase of certain of its holdings which are desired by the city. The court set March 5 as the date for the beginning of a series of court and jury trials to determine the amounts to be paid to the landowners. The city has indicated that it will be its policy to negotiate with property owners in an effort to purchase their properties without court action.

▼

¶Hearing of the application of the California State Grange for a downward revision of agricultural power rates of the Southern California Edison Co. and the elimination of the standby charge has been adjourned by the California Railroad Commission until April 20. The first session of the hearing was conducted January 16 at Visalia by Commissioner William Carr. The hearing, petitioned for by the Grange, is to present the case of the farmers served by the Edison company in Kern, Kings, Tulare and a portion of Fresno counties.

▼

¶Petitions seeking action on the construction of a municipal power plant for which $300,000 in bonds were voted in 1929 have been presented to the city council of Sandpoint, Idaho. The city has a power site on Priest River which was acquired by license from the Federal Power Commission in 1929.

Protest Washington Utility Budget Cuts

Unusual repercussions have developed in the state of Washington as a result of recent orders of the department of public works in that state reducing salaries of officials of utility companies and striking from their proposed budgets various donations, advertising expenses and similar items.

Community chests and charitable organizations from all over the state have addressed letters of protest to the governor, stating in the effect that utility companies, as good local citizens wherever they operate, have been liberal contributors to local charitable funds, which are in fact having a hard enough time to get along during these distressed times without having this source of revenue denied them. Further, newspaper editorials and comments have been prolific on the subject of forcing reductions in advertising budgets of utility companies, terming department rulings in respect of such expenditures as high-handed usurpation of the functions of management.

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L. A. Employees Sue For Reinstatement

Four former employees of the Los Angeles Department of Water and Power, who were dismissed by the board of water and power commissioners for "lack of work" after from four to twenty-nine years of service with the department, have filed suit in the county superior court, seeking reinstatement. The four are Otto C. Whitaker, chief water meter reader; Carl A. Heinze, electrical engineer; A. J. Ford, assistant right-of-way and land agent, and Orlando Northcutt, assistant publicity agent. They were dismissed last August by means of a series of resolutions adopted by the board.

The suit is a petition for a writ of mandate asking that the board be directed either to reinstate the four or to go into court to show cause why it should not be ordered to do so. The petition, charging that the resolution of dismissal was a "sham and pretext" on the part of the board, declares that the men were regular civil service employees and that no charges of any kind were preferred against any of them as a basis for dismissal.

▼

RCA-Victor Opens Hollywood Studio

RCA-Victor Co., Inc., has opened an electrical transcription department in its Hollywood plant, according to G. Harold Porter, vice-president in charge of Pacific Coast activities. W. Arthur Rush will be in immediate charge. Other similar divisions of the organization are already located in Camden, New York and Chicago.

Technical equipment will include playback facilities, four dubbing tables, four film channels and an unlimited number of microphones. The complete service will be available under one roof ranging from the recording to processing, pressing, packing and shipping.

While the RCA-Victor Co. will not stage or direct radio programs itself, its studio and stage facilities will now become available to others.

▼

Action Delayed on Los Angeles Codes

Probability that the Los Angeles electrical ordinance governing wiring will not become effective April 7, but will be completely revised, has developed as the result of meetings which have been held continuously during the last four months for the purpose of discussing its provisions. The ordinance as signed by the city council contains 68 articles, 499 sections and 160,000 words or almost twice as much material as the National Electrical Code. At the meetings between contractors, utility company representatives and manufacturers with the city electrical department amendments have been proposed that if adopted would exceed the ordinance in volume.

The standard electrical appliance ordinance is still in the hands of a committee of the city council awaiting favorable report. It has been approved by the city attorney and the Board of Building and Safety Commissioners.

▼

Advertising Warns of Kite Flying Hazards

The Southern California Edison Co., campaigning vigorously to impress upon children, and their parents, the need for observance of safety rules in flying kites, is using newspaper advertising and publicity to reinforce direct contacts being made through schools and boy and girl organizations. The accompanying advertising copy was used in all daily and weekly newspapers throughout the Edison company territory in February. At the same time, the papers carried a story which set forth the safety rules and urged parents and school authorities to co-operate in impressing upon the boys and girls the need for observance of the rules. The safety work in the schools and among the Boy Scouts and similar organizations includes safety lectures and the use of safety posters.

Look Out, Fellers!
Do not fly kites near Electric Wires!
Kite-flying time always brings heaps of fun to thousands of boys and girls. But in past years, kite-flying has resulted in serious injury to a few whose kites came in contact with power-lines. Every boy and girl should know these
3 SAFETY RULES
1. Do not fly kites anywhere near electric wires.
2. Never use wire or tinsel cord, or cord that has become damp from rain or fog.
3. If cord is caught in Power-Line...let go! Do not pull it. Call the power company to remove it and get your kite back for you.
Edison
SOUTHERN CALIFORNIA EDISON COMPANY LTD.

In Pasadena, where electrical service is furnished by the Municipal Light and Power Department, it was announced that consideration is being given to an ordinance to prohibit kite flying except in certain areas, such as the large Brookside Park and the area adjacent to the Rose Bowl, where there would be no likelihood of kites mixing with wires.

▼

Wholesalers Meet to Discuss Code

Various phases of the administration of the wholesalers' code and a review of power company merchandising programs for 1934 were features of the program of the annual meeting of the Pacific Division, National Electrical Wholesalers Association at Del Monte, February 1-3, 1934. J. A. Kahn, Salt Lake district manager of the General Electric Supply Corp., was elected chairmen of the division for the coming year.

In the open meeting, which was marked by an attendance of 125, the largest in the history of the divisional meetings, power company programs were reviewed by R. E. Fisher, vice-president, Pacific Gas and Electric Co.; W. L. Frost, vice-president Southern California Edison Co.; A. Emory Wishon, president, San Joaquin Light & Power Corp., and by George C. Tenney, editor, **Electrical West**, who reviewed the programs of those companies which could not be represented by executives in person.

In the regular golf tournament O. B. Stubbs, of the Stubbs Electric Co., Portland, won the historic Copper Cup; C. D. Purviance, Okonite Co., Los Angeles, won the Manufacturers and Oakes Cup and R. E. Fisher the central station trophy.

▼

¶ **The Washington Water Power Co.** has filed a protest with the Idaho PWA authorities against the application of the city of Couer d'Alene for $600,000 for municipal light and water systems. The protest states that the engineer's estimates of the proposed municipal systems are too low, that the city plants would compete with plants already in operation, and that business conditions in Coeur d'Alene do not justify such a loan.

▼

¶ **Gross earnings** of the Southern California Edison Co. for 1933 amounted to $35,251,629, a decrease of $1,906,762 from 1932, according to the company's annual report. Net earnings, after providing for operating expenses, taxes, depreciation, interest and dividends on preferred stocks, were $1.26 for each of the 3,204,141 shares of common stock outstanding during the year 1933.

▼

¶ **With five sessions** devoted to cold storage, ice plant operation, air conditioning, safety and other subjects, the National Association of Practical Refrigeration Engineers held its annual Pacific Coast conference at the William Taylor Hotel, San Francisco, February 23 and 24.

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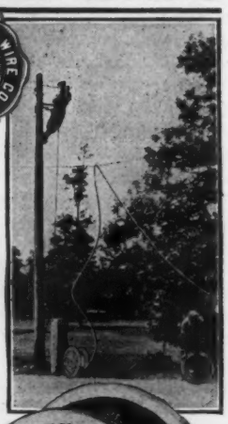

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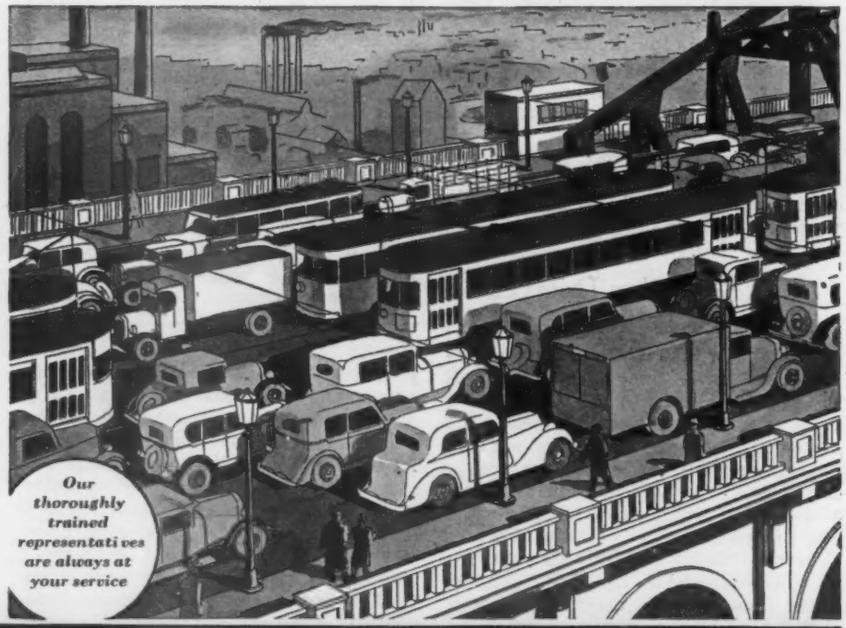

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Hotpoint Pioneer Dies in South

Earl Holmes Richardson, inventor of the Hotpoint electric iron and manager of the Ontario, Calif., plant of the General Electric Co., died suddenly January 31 at his Ontario home. His death followed a heart attack which he suffered earlier in the week. He was 62 years of age.

Mr. Richardson developed the Hotpoint iron while employed in a power house of the Stonecastle Power Co. at Ontario. Manufacture of the iron, and other appliances, first was carried on by the Pacific Heating Co. at Ontario. The plant subsequently was brought under the control of the Edison Electric Appliance Co., the Edison General Electric Appliance Co. and the General Electric Co., as at present. Mr. Richardson also was identified with the first electric railway in Ontario, having charge of its operation the first year after its completion.

Shortly after completing his high school studies in Kilbourne, Wis., where he was born, Mr. Richardson came to the West Coast. He was 22 years of age when he took up his residence in Ontario and was employed by the local power company.

Within recent years Mr. Richardson founded and developed as a hobby the Mojave desert community of Adelanto, forty miles north of San Bernardino. The community has become one of the garden spots of the desert and is famous for its poultry and fruit orchards. Mr. Richardson was president of the Adelanto Mutual Water Co. and the Adelanto Fruit Co. and a director of the Adelanto Development Co.

▼

¶John B. Gray, veteran employment officer of the Southern California Edison Company at Los Angeles, Calif., retired from active service February 1 after thirty-one years as a member of the Edison organization. His retirement was in accordance with the company's plan of recognition of long and faithful service of its employees. Mr. Gray became a member of the company on October 15, 1902. He first worked as a clerk in the Los Angeles office and later became chief clerk of the operating department. In 1926, because of his extensive experience in company operations and in employment matters, he was appointed to the personnel department. He was made assistant supervisor of that department in 1931 and was appointed supervisor of employment in 1932.

▼

¶Diversity Factor:—C. D. Russell, president of the Associated Wholesale Electric Co., Los Angeles, announces the addition of a radio line in the last few months. While this house had formerly devoted its attention principally to supply lines, in the last year it has been going more and more into appliances. Within a short time, Mr. Russell expects to have a complete line of household utility appliances and devices, holding that this diversity factor is most important to the continued success of the business.

▼ ▼ ▼

Barometer

Monthly reports of electrical energy consumption in the various branches of manufacturing indicate that activity in the Western States during January was maintained at the same average level as in December and about 15 per cent above that prevailing a year ago. Moreover, each industry group shows gains compared with the beginning of 1933.

The greatest advance continues to be in the group concerned with the production of iron and steel and with the working of these and other metals, the gain over January of last year amounting to 64 per cent. Including the slight downward revision of the index for December from the figure first announced, to incorporate late reports, it appears that the level attained in September has been virtually maintained during the succeeding months.

Foods, paper and pulp and shipbuilding were all somewhat more active than in December, while other branches receded, but these recessions were in all instances comparatively slight. Some of the returns for January have not yet been received and the index numbers for that month are, therefore, subject to revision.

During the past seven months the rate of industrial activity in the Western States, which had been gradually mounting since the latter part of 1932, has remained nearly constant, whereas in the country as a whole there has been a moderate though distinct decline during the same period.

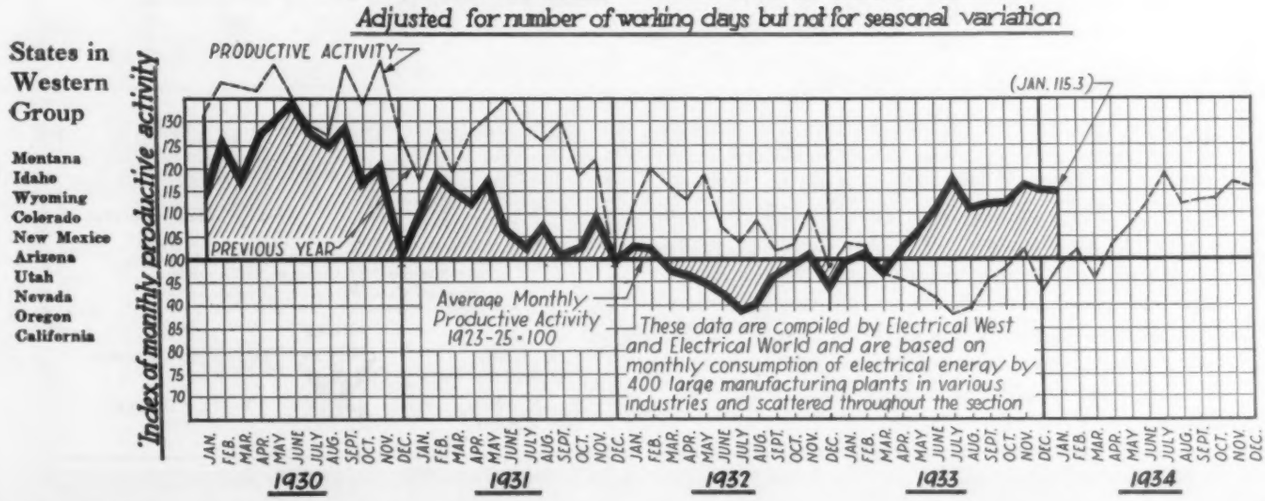
Index of Manufacturing Activity in the Western States

Base: Average month 1923-1925 100

(All figures adjusted for number of working days)

	Jan. 1934	Dec. 1933	Nov. 1933	Oct. 1933	Jan. 1933
All Industry	115.2	115.3*	116.9	113.3	100.0
Chemicals	90.8	92.7	86.0	91.2	78.2
Food products	122.8	116.3*	118.9	111.3	116.2
Metal groups	73.2	77.5*	76.3	75.3	44.6
Lumber	152.0	156.7	162.8	155.3	145.7
Paper and pulp	145.6	129.4*	135.0	145.4	138.4
Rubber products	80.7	84.0*	97.5	92.5	76.2
Shipbuilding	126.8	118.0	123.0	114.0	107.3
Stone, clay and glass	117.5	122.3	120.0	118.2	78.0

*Revision



Airmail

AVIATION is a popular industry. Therefore when the administration impatiently rebukes some of its promoters for their financial dealings with the Post Office Department by canceling all airmail contracts without warning, trial, or conviction, the public objects strongly. Even a popular president, who can do no wrong almost, has jeopardized the hero worship of his people by so precipitate an action. With the airmail carriers, this "strike first, try the case afterwards" technique is held up as a travesty upon liberty and the rights of citizens.

Yet just such a travesty is also being indulged in by the government with respect to the light and power companies, except that in their case, the action has dragged on for some years. The Federal Trade Commission was set upon the utilities to prove them crooks, traducers of school children, machinators of evil and enemies of The People, spelt in capitals. The evidence has not yet all been heard, the utilities were denied an opportunity to plead their own cause or give the reasons for some of their defensive measures against public ownership, and as yet no decision has been brought in by the commission.

This has not prevented the administration from assuming the verdict to be guilty and of meting out punishment by authorizing large scale competing projects, denial of fair play in a utility code, and harassing them in every way possible.

With the airmail, the public is keenly aware that the lives of half a dozen young lieutenants is a drastic price to pay for the chastisement of alleged graft. It is far harder to make the public see that the security and well-being of thousands of honest investors whose life savings are placed in utility securities is too great a price to pay to chastise a great industry by ruinous competition and administrative wrath. At least in either case, let the defendant have his full day in court.

▼

To Sell the Surplus

ELECTRICAL energy is a drug on the market in many sections of the West. With the completion of Boulder Dam, Bonneville and other projects, this apparent over-supply will be augmented tremendously. " . . . the industry must absorb and put to use these present and prospective surpluses . . . " says the California Railroad Commission. To the simple question "How?" there is but one answer: By popularizing electrical service and by reducing the average price to the consumer.

Accomplishment of this purpose is far more intricate than the mere statement of the fact. It is fraught with difficulties. As a matter of fact the industry itself has been working on this very problem for years with only tolerable results. But the happenings of the last few weeks seem to indicate that real progress may be expected. They prove that courage and initiative still exist in the light and power business.

San Joaquin Light & Power Corporation offers one example. For two months domestic and commercial customers can use all the electricity they want for the price they paid in March. Agricultural customers get the surplus for half price. "A plan to break the present consumer habit of economizing on electricity and to increase permanent use," President Emory Wishon calls it. After the free use period expires, domestic customers will be able to qualify for reduced promotional rates.

Minus the free use offer, Southern Sierras Power Company has initiated a similar plan. Pacific Gas and Electric Company is extending the surplus use offer on a half-price basis to its agricultural customers for a three-month period. Both Pacific Gas and San Joaquin have announced a one-cent rate available to range and water heater customers. In other sections of this territory there is significant talk of programs to stimulate greater use and thus permit lower rates.

To the industry as a whole, these innovations present outstanding merchandising opportunities. Without strong sales backing by manufacturer, wholesaler, retailer and contractor the purposes for which they were devised will not be achieved. And similarly these other branches will be overlooking a real sales opportunity.

It is only by such displays of initiative that present and prospective surpluses will be sold. And if at the same time the public benefits by increased convenience and lower rates, the experiments will have been doubly worthwhile.

the New ELECTRICAL WEST

Established 1887

With which is consolidated "Journal of Electricity"
Published Monthly at 883 Mission St., San Francisco,
by the McGraw-Hill Company of California.

Member Audit Bureau of Circulations
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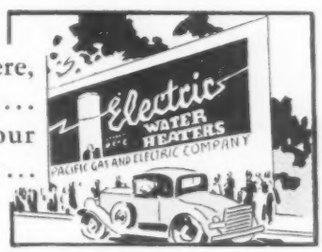
LOGICAL?

Picks up favorite newspaper ... sees big Electric Appliance Society ad ... or big P. G. & E. promotional ad ... reads WHY he should buy ... sees your Tie-in ad along side ... reads WHERE to buy ... what MAKE is best ... how much it COSTS ... starts thinking ...

★

goes to the office ... to the movies ... to the country ... anywhere, everywhere his eye is caught by billposters ... truck signs ... bill-stickers ... reminded constantly to Buy Now! ... See Your Dealer! ... Buy Now! ... See Your Dealer! ... can't forget ...



★

walks down town ... passes your store ... attracted by window ... brilliant lights ... beautiful appliances ... gleaming chromium ... colorful enamel ... desire-to-own increases ... why not? ... so easy ... reasonable prices ... attractive terms ... consults wife ...

★

wife studies newspaper ads ... notices billboards ... goes window shopping ... becomes enthused ... answers doorbell ... welcomes salesman ... finds him polite, eager to help, well informed ... hears clinching arguments ... decides to act ... re-visits store ...

★

selects model ... appliance installed ... goes to work ... proves indispensible ... wins family approval ... shown off proudly ... makes new friends ... dealer follows up sale ... gets prospects' names ... makes more sales ... invests in more Tie-ins ... Repeat!

YOU BET IT IS *It works*

★ **P·G·and E·** ★

PACIFIC GAS AND ELECTRIC COMPANY

Owned · Operated · Managed by Californians

If your feed costs more than a dime per hundred pounds—it pays to *GRIND IT!*

You hear people ask "Does it really pay to grind grains for stock feeding?"

The answer is YES—and it pays handsomely. Here is why.

As much *as half* of unground grain may pass through an animal undigested—wasted. And grinding, which costs only three to five cents per hundred pounds, reduces waste almost to zero!

For further information on feed grinding—ways to cut costs—types of feed grinders best suited for any particular job—write the Pacific Coast Electrical Bureau. You will be sent the facts you want to know—without charge or obligation.

This non-profit, impartial organization is ready to help you at any time—in any way it can.

Pacific Coast Electrical
447 Sutter St., San Francisco

Please send me information on: ...
dairy); ... Feed grinding, ... Portable
ers, Incubators, ... Soil heating, ...
tion desired)

Name: .....

Address: .....

City .....

ALMOST every woman has her heart set on some day owning an electric range. It is so wonderfully modern, so superior for cooking, so pleasing to look at!

Yet some women may be delaying their enjoyment because they believe an electric range costs somewhat more to operate.

Perhaps you [illegible]

—the current you use for heating, appliances, etc., will cost you *less* if you cook by electricity!

See your dealer, your electric light company or send the attached coupon to this impartial, non-profit organization supported by all branches of the electrical industry.

The answers

to 3 practical questions on electric refrigeration for the home and dairy

question: *How is electric refrigeration any real economy in the dairy? In the house?*

answer: In the dairy, quick, reliable cooling of milk keeps down bacteria count, lessens spoilage, and enables you to get better prices for your dairy products. Electric refrigeration is the *most dependable, most economical way to keep milk cool.*

In the house, electric refrigeration eliminates food spoilage. Enables you to buy more perishables in advance. Saves trips to town. Enables you to safely store small products you want to sell on the next trip to market.

question: *What has the size of an electric refrigerator to do with operating costs?*

answer: Very little. Energy consumption does not depend on size. Pick out a model big enough to serve your needs and see that it is properly insulated, well constructed—these are the main items affecting energy cost. And it costs so very little to operate any good electric refrigerator.

question: *Why is electrical refrigeration better?*

answer: There are many reasons. Here are a few: With its automatic control the electric refrigerator maintains a *constant* low temperature. Electricity is always available. Electric refrigeration provides dry [illegible] checks the growth of molds which thrive in damp air. [illegible] is absolutely *clean*. Clean food keeps better in a

* * *

[illegible] estions on also- [illegible] plans for home [illegible] ases using elec- [illegible] — plans and estimates—write the Pacific Coast Electrical Bureau. You will be sent the facts you want to know—without charge.

[illegible] cal Bureau, Department *D-5*
[illegible] Francisco:

[illegible] on: ☐ Refrigeration, (house and dairy), ☐ Pumping, [illegible] table motors, ☐ Farm lighting, ☐ Brooders, Incubators, [illegible] Equipment.

Name .....

State .....

THESE are March advertisements sponsored by Pacific Coast Electrical Bureau to increase your business!

Each month over 360,000 messages go to housewives, farmers, engineers, business men and builders—stimulating sales for all factors of the electrical industry. Cooperate with this merchandising activity for your own profit!

Pacific Coast Electrical Bureau
447 Sutter St., San Francisco
Department N-3

Dear Mr. Architect:

We know you won't forget adequate lighting in your plans for stores, commercial buildings, industrial plants, etc. But we thought it might help you if you had some figures to back up your contentions. The Pacific Coast Electrical Bureau has gathered an array of facts which convincingly prove increased working efficiency in properly lighted buildings; that the rental value of buildings is enhanced by proper lighting; losses from accidents, injuries, spoilage are decreased.

When you have occasion to need such proof of the value of light we shall be glad to supply it.

This Bureau will also assist in problems of planning, either for wiring of new buildings or re-wiring of old ones, without cost to you.

Cordially yours,

Pacific Coast Electrical Bureau

447 SUTTER ST., SAN FRANCISCO
(Department K-3)

Crack down on your production costs!

***Correct-speed electric pumping* is writing sensational economies into hundreds of operating records.**

LIKE to slash power costs to 29% of production expense . . . shut-down time to 8%? *Correct-speed electric pumping* did exactly that for one major oil company.

For another, it reduced lifting costs on an entire lease 77.8%—at no sacrifice in production.

In one typical instance, single well production has been upped from 19 to 35 barrels a day—and in another, from 8 to 36!

Briefly, the main benefits of *correct-speed electric pumping* are these: Increased production, reduction in power cost, lowered maintenance and labor costs. There are other advantages, including reduced dehydration costs and an outstanding safety factor, in gassy areas.

If you are interested in effecting *sizeable production economies*, this Bureau will be glad to furnish you with full, authoritative information on *correct-speed electric pumping*, on converting present equipment or on new installations. Write to:

PACIFIC COAST ELECTRICAL BUREAU
447 Sutter St., San Francisco
Department O-5

Suggestion to industrial executives:

Have a look at Joe's eye

Joe, the skilled laborer, may not understand why he's always fagged out—why his work in the shop goes haywire so often—but Joe's eye knows!

In seven out of ten industrial establishments work is slower and poorer, production costs run wastefully high because of improper lighting.

In those seven—efficient lighting can increase per-man production by from 10% to 35%—effect economies in proportion.

Efficient lighting is not necessarily *more* lighting. Often-times it is simply a matter of *better placing*. Or maybe you are not getting the best use of the electricity you are paying for.

In any case, from a *dollars and cents* standpoint alone, proper illumination is too big a factor to overlook or to settle by guesswork.

This impartial, non-profit Bureau will be glad to discuss industrial lighting problems with you, to furnish you with the latest information in the field, and to make practical suggestions.

Communicate with our nearest office. It can cost you nothing—and the odds are that it will save you money.

PACIFIC COAST ELECTRICAL BUREAU
447 Sutter Street, San Francisco